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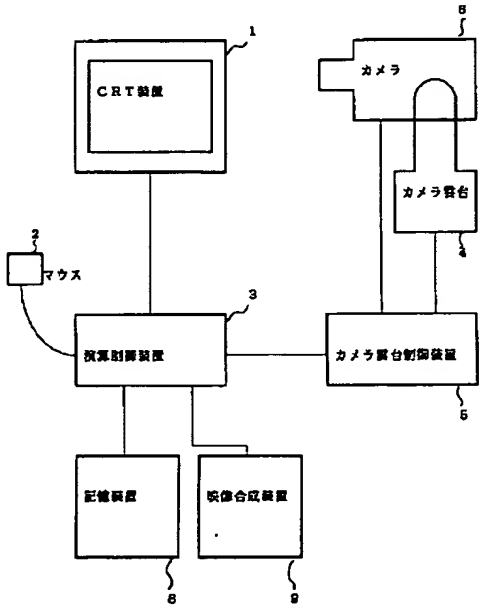
(54)【発明の名称】　地図情報連動監視カメラ制御装置

(57)【要約】

【構成】　カメラ６の撮影映像と対象物及びその付近の地図情報を同一ＣＲＴ装置１上に表示させ、地域情報入力手段２により地図上からカメラ制御をおこなったり、カメラ制御情報（パン、チルト、ズーム）をカメラ雲台制御装置から入手しこれに連動させて該当地域や異縮尺の地図を記憶装置８から検索表示したり、同様にカメラ制御情報からカメラ撮影範囲を地図上に表示させたり、カメラ６の撮影映像を地域情報入力手段２により指示することで特定地域情報をＣＲＴ装置１上に表示させたりすることを演算制御装置３を中心とした構成で実現する。

【効果】　カメラ位置が地図上で把握できると共に、カメラレンズのズーム比に合わせて地図の縮尺を可変表示し、カメラ撮像映像の地域情報を同一ＣＲＴ上に表示できる。



1　CRT装置
2　地域情報入力手段（マウス）
3　演算制御装置
4　カメラ雲台
5　カメラ雲台制御装置
6　カメラ
8　記憶装置
9　映像合成装置

【特許請求の範囲】

【請求項１】　監視カメラと、上記監視カメラをカメラ制御情報に基づいて制御するカメラ制御装置と、地域情報と地図情報を記憶する記憶装置と、記憶装置に記憶された地域情報と地図情報に基づくコンピュータ画像を上記監視カメラの撮影映像と合成する映像合成装置と、上記映像合成装置により合成された合成画像を表示する表示装置と、地図上の特定箇所を入力する地域情報入力手段と、上記監視カメラと上記カメラ制御装置と上記表示装置と上記地域情報入力手段と上記記憶装置が接続された演算制御装置から構成されることを特徴とする地図情報連動監視カメラ制御装置。

【請求項２】　監視カメラと、上記監視カメラをカメラ制御情報に基づいて制御するカメラ制御装置と、地図情報を記憶する記憶装置と、上記地図情報に基づく上記監視カメラが撮影している場所の地図及び上記監視カメラの撮影映像を表示する表示装置と、地図上の特定箇所を入力する地域情報入力手段と、上記監視カメラと上記カメラ制御装置と上記表示装置と上記地域情報入力手段と上記記憶装置が接続された演算制御装置から構成され、地図上の特定箇所を上記地域情報入力手段で指示することにより、指示された特定箇所を上記監視カメラが予め定められた撮影画面の大きさ（ズーム比）で撮影出来るように、上記演算制御装置が上記監視カメラのズーム比を演算しこれらをカメラ制御情報として上記カメラ制御装置に送信し上記監視カメラを制御することを特徴とする地図情報連動監視カメラ制御装置。

【請求項３】　上記演算制御装置は、さらに、カメラ制御情報を基に記憶装置に記憶された地図情報に基づいてズーム比に応じた適当な縮尺の地図を上記表示装置上に表示することを特徴とする請求項１記載の地図情報連動監視カメラ制御装置。

【請求項４】　監視カメラと、上記監視カメラをカメラ制御情報に基づいて制御するカメラ制御装置と、地図情報を記憶する記憶装置と、上記地図情報に基づく上記監視カメラが撮影している場所の地図及び上記監視カメラの撮影映像を表示する表示装置と、地図上の特定箇所を入力する地域情報入力手段と、上記監視カメラと上記カメラ制御装置と上記表示装置と上記地域情報入力手段と上記記憶装置が接続された演算制御装置から構成され、演算制御装置は、上記監視カメラの撮影範囲を演算し、演算された撮影範囲を示すマークを表示装置に表示された地図上に表示することを特徴とする地図情報連動監視カメラ制御装置。

【請求項５】　監視カメラと、上記監視カメラを制御するカメラ制御装置と、地図情報及び地図情報に関連付けされた地域情報を記憶する記憶装置と、上記地図情報に基づき上記監視カメラが撮影している場所の地図及び上記監視カメラの撮影映像を表示する表示装置と、上記地域情報を入力する地域情報入力手段と、上記監視カメラと上記カメラ制御装置と上記表示装置と上記地域情報入力手段と上記記憶装置が接続された演算制御装置から構成され、上記記憶装置に記憶された上記地域情報を上記地域情報入力手段にて入力することにより、上記演算制御装置が、入力された地域情報に基づいて、上記記憶装置から関連付けされた地図情報を検索し、検索された地図情報に基づく地図あるいは、撮影映像を上記表示装置上に表示することを特徴とする地図情報連動監視カメラ制御装置。

【請求項６】　上記地図情報連動監視カメラ制御装置はさらに、地域情報を表示装置に表示することを特徴とする地図情報連動監視カメラ制御装置。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は、公共建造物（例えば道路、ダム、河川）の監視カメラや、市街地を監視する望楼カメラにカメラ制御情報を入力する場合や、撮影画像から該当撮影場所の地図を検索する場合や、地図上にカメラ撮影範囲を示すマークを表示する場合及びカメラ撮影映像から特定地域情報を表示出力する場合等に適用される監視カメラ制御装置に関する。

【０００２】

【従来の技術】図１５及び図１６は特開平４－１６９９１３号公報に示された従来のカメラ制御装置を示す構成図及び制御アルゴリズムである。図において１は対象物及びその付近のデジタル地図を表示するモニタ装置、２はモニタ装置の表示面に設置され地図上の位置を指示されたら該当する座標信号を出力するタッチパネル、３はタッチパネルからの座標信号からカメラの指向方向を計算するための計算器、４はカメラを支えるカメラ雲台、５はカメラ雲台を制御するカメラ雲台制御装置、６はカメラ、７はカメラ撮影映像表示用モニタ装置である。

【０００３】次に動作について説明する。オペレータがモニタ装置１の表示面に表示されたデジタル地図を見て、表示面を押すことによりカメラを向けたい所望の位置を指定すると、タッチパネル２から座標信号が計算器３に入力される。計算器３は入力座標信号によりカメラ６の指向方向角度との偏差信号をカメラ雲台制御装置５へ送る。カメラ雲台制御装置５は入力に応じてカメラ雲台４を制御しカメラ６を上記指定された位置に向けるように制御する。

【０００４】

【発明が解決しようとする課題】従来のカメラ制御装置は以上のように構成されているのでモニタ上に表示された地図情報からカメラの指向方向（パン、チルト）を計算しカメラを制御するのみであった。この方法では常に地図からしかカメラ制御ができないため監視カメラを制御しようとしても先に肉眼で大凡の対象物位置を知る必要があり、モニタ上に表示された地図情報から対象物位置が分らなければカメラ操作ができなかった。また、地

図を表示する際、異なる縮尺地図の利用を考慮していないため、カメラ制御ではズーム機能に伴う地図連動制御ができなかった。このように、撮影画像の拡大比率に関係なく表示地図は一定縮尺であるため撮影対象物及びその付近の地図が見づらかった。また、現状のカメラ指向角度から関係する地図の表示機能を考慮していないため、カメラが地図上でどちらを撮影しているのかが不明となってしまう。また、カメラ撮影範囲や撮影映像内の特定地域の情報も得ることができず、さらに、また地図表示と撮影画像が同一ＣＲＴ上でなく別々のＣＲＴまたはモニタに表示されるため見づらくなるなどの問題点があった。

【０００５】本発明は上記のような問題点を解消するためになされたものでカメラ位置が地図上で把握できると共に、カメラレンズのズーム比に合わせて地図の縮尺を可変表示し、１台のＣＲＴモニタ上にカメラ位置を記した地図表示とカメラの撮影映像を同時表示し、カメラ撮影映像を地域情報からＣＲＴ上に表示できる装置を得ることを目的としている。

【０００６】

【課題を解決するための手段】本発明に係わる地図情報連動カメラ制御装置は、監視カメラと、上記カメラの指向方向（パン、チルト）及びズームレンズのズーム比、フォーカスなどを制御するカメラ雲台制御装置と、コンピュータ画像とカメラ撮影映像とを合成する映像合成装置と、同一表示面上に上記監視カメラの対象物及びその付近の地図及び上記監視カメラの撮影映像を同時表示するＣＲＴ装置、地域情報を入力する手段、異なる縮尺の地図情報及び地域情報を記憶・蓄積・再生する記憶装置、上記監視カメラと上記カメラ雲台制御装置と上記映像合成装置と上記ＣＲＴ装置と上記地域情報入力手段と上記記憶装置が接続された演算制御装置から構成され、上記ＣＲＴ装置が上記映像合成装置により、合成された合成映像を表示することを特徴とする。

【０００７】また、上記ＣＲＴ装置上に表示された地図上の特定箇所を上記地域情報入力手段で指示することにより上記ＣＲＴ装置上の指示位置から実際の上記監視カメラの指向方向（パン、チルト）と予め定められた撮影画面の大きさ（ズーム比）で撮影が出来るように上記監視カメラのズーム比やフォーカス値を演算しこれらをカメラ制御情報（パン、チルト、ズーム比など）として上記カメラ雲台制御装置に送信し上記監視カメラを制御することを特徴とする。

【０００８】また、上記カメラ雲台制御装置から受信したカメラ制御情報（パン、チルト、ズーム比など）を基に現在撮影されている対象物及びその付近の地図でズーム比に応じた適当な縮尺の地図情報を上記記憶装置から検索し上記ＣＲＴ装置上に表示することを特徴とする。

【０００９】また、上記監視カメラの撮影範囲を示すマークを地図情報上に表示することを特徴とする。

【００１０】また、上記ＣＲＴ装置上に表示された上記監視カメラ撮影映像の特定箇所あるいは地域情報を上記地域情報入力手段にて指示することにより、上記演算制御装置が、指示された地域情報に基づいて、上記記憶装置から関連付けされた地図情報を検索し、検索された地図情報に基づく地図あるいは撮影映像を上記表示装置上に表示することを特徴とする。

【００１１】また、指示された箇所の地域情報を上記ＣＲＴ装置上に表示することを特徴とする。

【００１２】

【作用】この発明に係る地図情報連動監視カメラ制御装置は、映像合成装置により地図情報とカメラ撮影映像を合成し、カメラ制御情報（パン、チルト、ズームレンズ比等）を基に地図情報とカメラ撮影映像を１台のＣＲＴ装置上に表示する。また、地図上での指示位置に応じてカメラの指向方向、ズームレンズ比を制御する。また、地図表示に際しては記憶手段が記憶された地図情報に基づきズームレンズ比に合わせて最適な縮尺の地図情報を検索して表示する。また、地図上にカメラの撮影範囲を表示する。また、カメラ撮影映像の特定位置あるいは、住所及び電話番号等の地域情報を入力することにより、指定された場所の地図を表示する。また、地図の表示に加えて特定地域情報を表示する。

【００１３】

【実施例】実施例１．以下、本発明の一実施例を図について説明する。図１においては図１５の対応する部分には同一符号を付しており、機能的に同程度であるものは説明を省略する。

【００１４】図１において、２はＣＲＴ装置１上の地図表示やカメラ撮影映像の特定位置を入力する地域情報入力手段であり、本実施例ではマウス、３はカメラ６の制御値を計算したり、カメラ６の現在指向角度やズームレンズ比から該当する地図情報を検索表示したり、特定地域情報の検索表示を行う演算制御装置、６はズームレンズ付きのカメラ、８は異なる縮尺の地図情報データや特定地域情報を蓄積した記憶装置、９は地図情報等のコンピュータ画像とカメラ撮影映像を同一画面上に表示させる映像合成装置である。

【００１５】図２は図１６に相当するカメラ制御アルゴリズムである。

【００１６】図３はカメラの撮影映像から撮影地点の位置を特定する方法を説明する参考図であり、カメラ装置を水平方向から見た図である。

【００１７】図４はカメラの撮影映像から撮影地点の位置を特定する方法を説明する参考図であり、カメラ装置を鉛直方向から見た図である。

【００１８】図５はカメラの撮影映像から特定地域情報を検索するためのアルゴリズムである。

【００１９】また図６、図７、図８、図９は本発明の詳細を説明する図であり、これらの図において図６はＣＲ

Ｔ装置１の基本画面であり、１１は表示枠、１２は地図情報の表示枠、１３はカメラ撮影映像の表示枠、１４は地域情報の表示枠、１５はカメラの制御表示枠、１６は地図表示上のカメラ設置位置、１７は地図表示上のカメラの撮影範囲を示す境界線、１８、２９、２０は地図表示またはカメラ撮影映像上でマウス２で指示された位置を示す。

【００２０】次に動作について説明する。カメラ６はカメラ雲台と一体化して固定設置されており、外部からの指令により一般に下記のような各種制御が可能となっている。カメラ水平角度（パン）、カメラ垂直角度（チルト）、ズーム等。尚カメラにはその他に焦点、絞り、結露防止ヒータ、ワイパー等の制御も可能であるが、本発明と無関係のためこれらの説明を省略する。

【００２１】図２は、この実施例に基づくカメラ制御アルゴリズムを示すフローチャートである。この実施例においては演算制御装置３はカメラ雲台制御装置５から、定期的にカメラの状態を入力する。演算制御装置３はカメラを制御するためにカメラ制御情報（パン、チルト、ズーム比など）を演算してカメラ雲台制御装置５に送信することにより、カメラを制御することが可能であるが、カメラ自身及びカメラ雲台制御装置自身がカメラ制御情報を発生したり、あるいは演算制御装置３から送られたカメラ制御情報に基づいて動作するという場合が存在する。従って、カメラ制御装置３はカメラ雲台制御装置５から定期的にあるいは任意の時間でカメラ雲台制御装置からカメラの現在の状態をチェックする。図２に示したフローチャートは演算制御装置がカメラ雲台制御装置からカメラの状態を入力するたびに実行されるものである。

【００２２】先ずＳ１において、カメラ雲台制御装置５からカメラの現在の指向方向及びズームレンズ比の数値を演算制御装置３が入力する。次に演算制御装置３はＳ２において、マウス等の地域情報入力手段２を用いてオペレーターがＣＲＴ装置値に表示された地図上からのカメラ制御指示があるかどうかをチェックする。もし、マウス等により地図上の特定箇所が指定された場合には、Ｓ３において、指定された特定箇所に基づく制御指示の値と、Ｓ１においてカメラ雲台制御装置５から入力したカメラの現在の指向方向、及びズームレンズ比の偏差数値を演算する。

【００２３】次にＳ４においては、演算制御装置３は、演算して求められた偏差数値に基づきカメラの指向方向及びズームレンズ比の移動量をカメラ雲台制御装置５に送出する。カメラ雲台制御装置５は演算制御装置３からこれらのカメラ制御情報を受信し、指定された状態にカメラを制御する。前述したＳ２において、マウス等からカメラ制御指示がなかった場合には、Ｓ５において演算制御装置３は予め記憶しておいた前回のカメラの指向方向及びズームレンズ比の数値と今回の数値との変化をチェックする。前回の数値と今回の数値に変化がある場合には、Ｓ６において、指向方向とズームレンズ比の偏差数値を演算する。そしてＳ７において、演算された偏差数値を基に、記憶装置に記憶された地図情報を検索し、検索した地図情報から地図をＣＲＴ装置に表示する。

【００２４】このようにＳ５からＳ７のステップを経ることにより、ＣＲＴ装置にはカメラが撮影している最新の映像に関する地図情報が表示されることになる。

【００２５】前述したＳ５において、前回の数値と今回の数値に変化がない場合には、カメラは同一場所を撮影していることになるため、Ｓ８においてＣＲＴ装置の表示内容はそのままであり、同一地図情報が表示され続ける。

【００２６】操作者は演算制御装置３に接続されるマウス２とＣＲＴ１を使用して操作を行う。図６はＣＲＴ装置１の基本画面であり、各種表示枠はそれに該当する機能が必要なときに表示されこの表示制御は演算制御装置３により行われる。

【００２７】図７は図６の基本画面に具体的な表示内容を記した画面である。図７において１２は地図情報の表示枠であり、地図上にはカメラ設置位置１６やカメラの撮影範囲１７を示す境界線、これに現在のカメラが撮影しているビデオ映像が表示された表示枠１３が表示された画面例である。同一画面上に地図情報等のコンピュータ画像とビデオ映像を表示する機能は映像合成装置９にて行っている。

【００２８】この図においてカメラ設置位置１６はカメラが固定設置であるため、予め演算制御装置３に登録することにより地図上表示を行う。またカメラの撮影範囲１７を示す境界線はカメラのカメラ水平角度（パン）、カメラ垂直角度（チルト）、ズーム、を示す情報をカメラ雲台制御装置５から入力し、これと予め登録されているカメラの設置高度値及び表示地図の縮尺から計算し表示を行う。このカメラの撮影範囲１７を示す境界線はコンピュータ画像として生成され、映像合成装置９にて他の地図情報等のコンピュータ画像とともに同一画面上に表示される。

【００２９】図７において操作者は、地図上で現在のカメラの指向方向とズーム比に応じた地図表示及びカメラ撮影範囲を示す境界線１７及びカメラ撮影映像を同一ＣＲＴ装置１上に得ることができる。図７は任意地点１８を中心にしたＣＲＴ画面例であるため、任意地点１８から任意地点１９にカメラ制御する場合について以下に説明する。

【００３０】図７において、マウス２により地図上の任意位置１９を指示することにより、演算制御装置３では、マウス２から入力されるＣＲＴ座標位置をもとにカメラの現在指向方向との偏位及び任意位置１９の周辺が把握できるようなカメラズーム比を計算し、これをカメラ雲台制御装置に渡しカメラ６及びカメラ雲台４を制御

し任意位置１９及びその周辺の撮影映像が得られるようにする。同時にカメラズーム比により適当な縮尺の地図を検索しＣＲＴ装置１上に表示させる。また新しく任意地点１９に対応したカメラのカメラ水平角度（パン）、カメラ垂直角度（チルト）、ズーム情報及びこれと予め登録されているカメラの設置高度値及び表示地図の縮尺からカメラの撮影範囲１７を示す境界線を計算し新しく検索表示した地図上に表示させる。これの処理を行った結果のＣＲＴ画面例が図８である。

【００３１】図８はカメラの制御表示枠１５も同時表示された例である。このカメラの制御表示枠１５を利用してカメラ６を地図位置を指示することなく制御することも可能である。例えばカメラの制御表示枠１５のパンの「左」をマウス２で指示することにより、演算制御装置３ではカメラ６を左方向に回転させる制御信号をカメラ雲台制御装置５に渡す。その他のカメラ設置位置１６やカメラの撮影範囲１７を示す境界線は前記に説明した通りである。このとき、カメラの撮影範囲が現在表示中の地図上に表示できなくなれば、記憶装置３から適当な地図情報を検索表示しこの地図上でカメラ設置位置１６やカメラの撮影範囲１７を再計算し表示する。

【００３２】図９はカメラ撮影映像表示枠１３の映像上の任意地点２０を指示することにより、この地点に登録された地域情報を地域情報の表示枠１４に表示した画面例である。以下この表示機能の詳細を説明する。カメラ撮影映像表示枠１３の任意地点２０はＣＲＴ装置１上の座標で演算表示装置３に入力される。演算表示装置ではカメラのパン、チルト角、ズームレンズ比から現在表示され且つマウス２で指定した地点の座標（例えばカメラ設置位置１６を中心にした角度と距離）を図５のアルゴリズムにより求め、この座標をもとに予め登録してある特定地域情報を検索しＣＲＴ装置１に表示させる。図５はカメラ設置位置を中心とした角度、距離を求めることにより、これを検索キーとして特定地域情報を求めるためのアルゴリズムであり、カメラ撮影画面の中央点の地図上での位置を演算後にマウスで指示された位置の角度、距離を演算する方式を説明している。図３、図４はカメラ撮影画面の中央点の地図上位置を演算するための参考図であり、カメラの設置高度、パン、チルト角、ズームレンズ比で中央点が演算可能であることを示している。

【００３３】次に図５のフローチャートにもとづいて、前述した図２のＳ３におけるマウス等の特定箇所の指示があった場合に行われる現在の指向方法の偏差数値の演算方法について説明する。図５のフローチャートは偏差数値の演算に加えて、特定地域情報を検索する方法についても述べており、ここで両者を合わせて説明する。

【００３４】図５のＳ１０において予め記憶装置にカメラ設置位置を起点として、距離Ｌと方位θごとに特定地域情報を記録しておく。図１０は記憶装置に記憶された特定地域情報の一例を示す図である。特定地域情報としては、町の名前、山の名前、川の名前、ビルの名前、タワーの名前等の地域情報が記録されており、これらの地域情報が存在する位置を示すために、カメラ設置位置を起点とした距離Ｌと方位θがそれぞれ記録されている。このように、図１０に示す特定地域情報が記録装置に記録された状態で図９に示したように、任意地点２０が指示された場合について説明する。

【００３５】先ず、Ｓ１１において、現在のカメラの画面中央点を演算する。図１１はこの動作を示す図であり、点Ｂが現在のカメラの中央点であるものと仮定する。この中央点Ｂは座標軸上でＸ１，Ｙ１という座標を有しているものとする。カメラのパン、チルト角からカメラの撮影映像画面中央点の地図上での距離Ｌ１と方位θ１が中央点を示す値として求められる。次にＳ１２において、指定された任意地点の座標入力値とカメラ撮影画面中央点の座標値偏差を演算する。図１１において、点Ｃをマウスにより指定された任意地点２０と仮定する。この点Ｃのマウス座標入力値をＸ２，Ｙ２とする。従って、マウス座標入力値とカメラ撮影画面中央点の座標値はそれぞれＸ１，Ｙ１及びＸ２，Ｙ２となり、それぞれの偏差はＸ１－Ｘ２、及びＹ１－Ｙ２により求められる。次にＳ１３において、求めた座標値偏差を基にマウス入力された箇所とカメラ撮影画面中央点の地図上での距離偏差ＰＬを演算する。ＰＬは図１１（ｂ）に示すように、Ｘ座標の差の絶対値の２乗とＹ座標の差の絶対値の２乗の平方根により求められる。次にＳ１４において前述した画像画面中央点の距離Ｌ１と方位θ１及び距離偏差ＰＬからマウス入力された箇所のＬ２と方位θ２を演算する。次にＳ１５において、求められた任意地点Ｃの距離Ｌ２および方位θ２を基に図１０に示した特定地域情報を検索する。検索する場合には、距離Ｌ２及び方位θ２に最も近い値を持つ特定地域情報が検索され、ＣＲＴ装置に表示される。例えば、図１１における距離Ｌ２及び方位θ２が図１０における距離ＬＡ及び方位θＡに最も近いことが判定された場合には、図９の１４に示すように、特定地域情報として○○町付近、△△山という特定地域情報が表示される。

【００３６】実施例２．次に、図１２に他の実施例の構成を示す。図１２に示される実施例は地域情報入力手段に関して図１で示したマウスの代替としてキーボードを付加したものである。キーボードからはＣＲＴ装置１上の特定位置をカーソルを移動させることで指示可能である。また地域情報例えば住所や電話番号等の文字データを演算制御装置３に入力することが可能である。実施例１では、カーソル座標位置を入力する場合を示したが、住所や電話番号等のデータからカメラの指向方向やズームを制御させることも可能である。

【００３７】図１３はこの実施例による地域情報の一例を示す図である。図１３においては、特定地域情報とし

て住所、電話番号、及び氏名を用いる場合を示している。例えば、キーボードから住所を入力した場合には、その住所に該当する距離Ｌと方位θが検索される。同様に電話番号によっても、距離Ｌと方位θが検索出来る。更に、氏名を用いても距離Ｌと方位θを検索することができる。

【００３８】又図１４は地域情報の他の例を示す図であり、特定地域情報として電柱番号を用いる場合を示している。例えば、電柱番号１を指定することにより、その電柱が存在している距離Ｌと方位θを検索することが可能である。また、前述した実施例で示した図１０のように、特定地域情報として町の名前を用いてもかまわない。あるいは特定地域情報としてビルの名前、山の名前等を用いるようにしてもかまわない。

【００３９】

【発明の効果】以上のように、この発明によれば常にカメラの撮影位置を把握することが可能で、ズームレンズ比に応じて詳細な地図の利用が可能で、また映像上の特定地名などを把握することが可能であるため対象とする地図に不案内の人やカメラ操作に不慣れな人でも効果的に監視カメラを利用できる等の効果がある。

【図面の簡単な説明】

【図１】この発明の一実施例による地図情報連動監視カメラ制御装置のブロック図である。

【図２】この発明の一実施例による監視カメラの制御アルゴリズムを示す図である。

【図３】この発明の一実施例による監視カメラの撮影映像から撮影地点の位置を特定する方法を説明する参考図であり、カメラ装置を水平方向から見た図である。

【図４】この発明の一実施例による監視カメラの撮影映像から撮影地点の位置を特定する方法を説明する参考図であり、カメラ装置を鉛直方向から見た図である。

【図５】この発明の一実施例による監視カメラの撮影映像から特定地域情報を検索するためのアルゴリズムを示す図である。

【図６】この発明の一実施例によるＣＲＴの基本画面図である。

【図７】この発明の一実施例によるＣＲＴの画面例を示す図である。

【図８】この発明の一実施例によるＣＲＴの画面例を示す図である。

【図９】この発明の一実施例によるＣＲＴの画面例を示す図である。

【図１０】この発明の一実施例による特定地域情報の一例を示す図である。

【図１１】この発明の一実施例による特定地域情報を検索する動作を説明するための図である。

【図１２】この発明の他の実施例による地図情報連動監視カメラ制御装置のブロック図である。

【図１３】この発明の他の実施例による特定地域情報を示す図である。

【図１４】この発明の他の実施例による特定地域情報を示す図である。

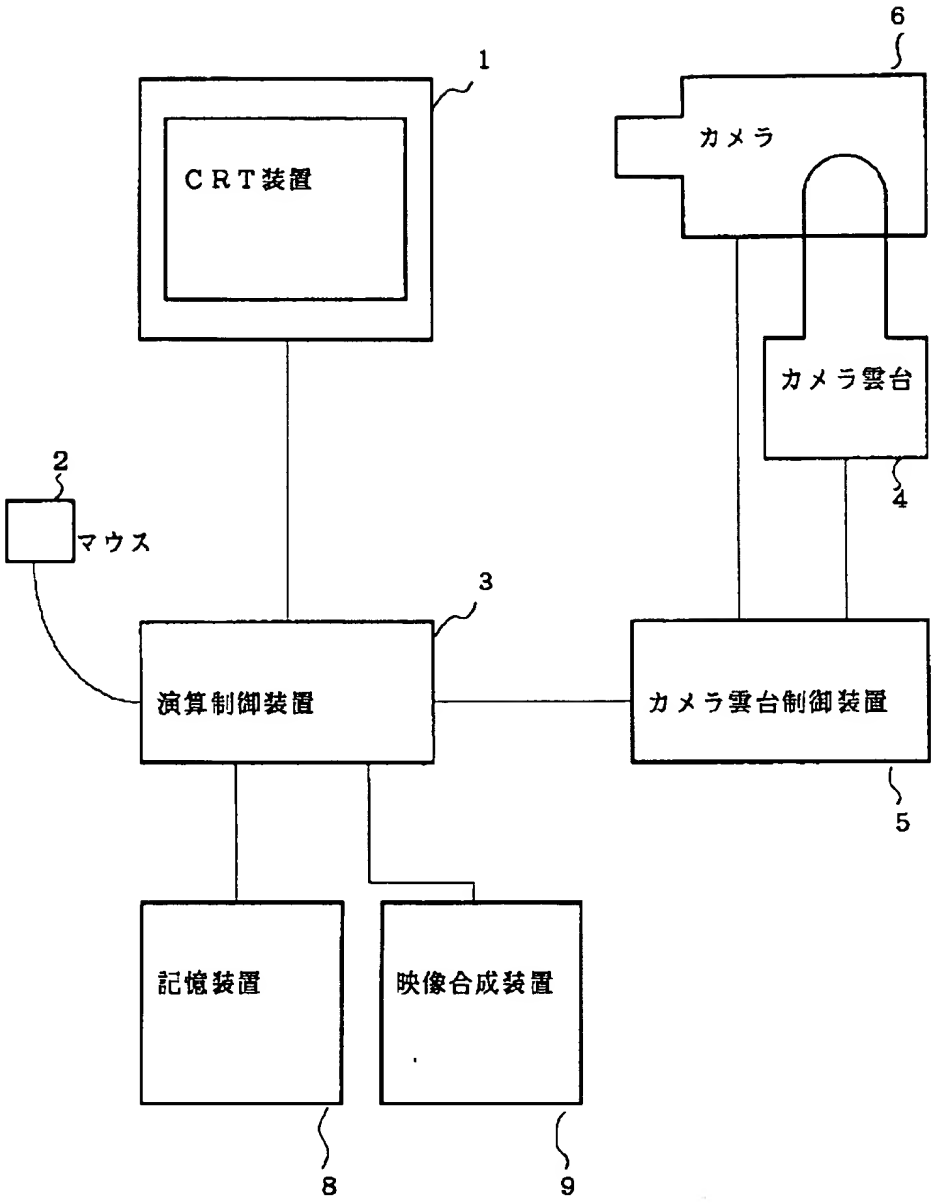
【図１５】従来の地図情報連動監視カメラ制御装置のブロック図である。

【図１６】従来の地図情報連動監視カメラ制御装置の制御アルゴリズムを示す図である。

【符号の説明】

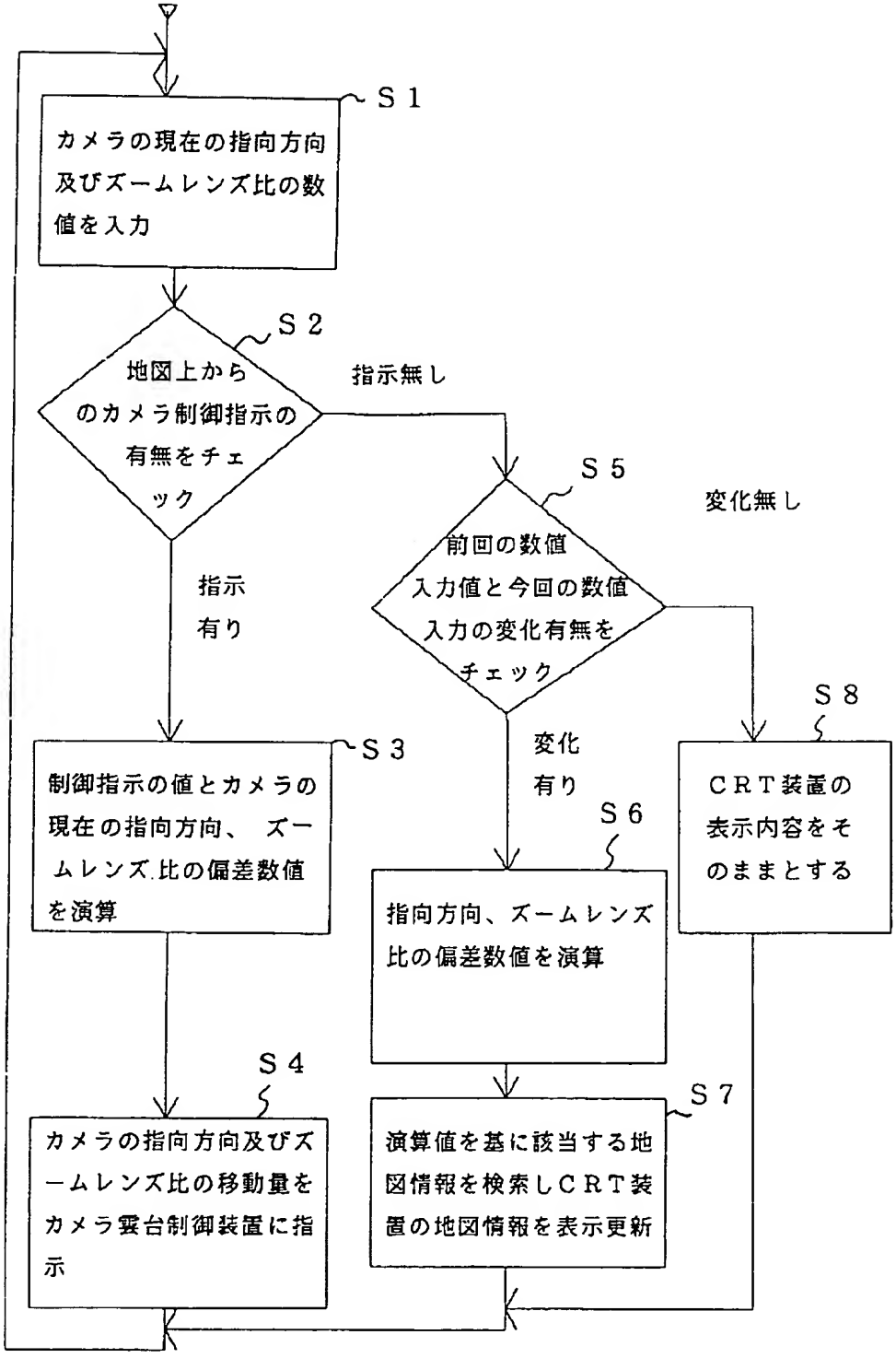
１　ＣＲＴ装置
２　マウス
３　演算制御装置
４　カメラ雲台
５　カメラ雲台制御装置
６　カメラ
７　モニタ
８　記憶装置
９　映像合成装置
１１　表示枠
１２　地図情報の表示枠
１３　カメラ撮影映像の表示枠
１４　地域情報の表示枠
１５　カメラ制御表示枠
１６　カメラ設置位置
１７　撮影範囲を示す境界線
１８　任意位置
１９　任意位置
２０　任意位置

【図１】

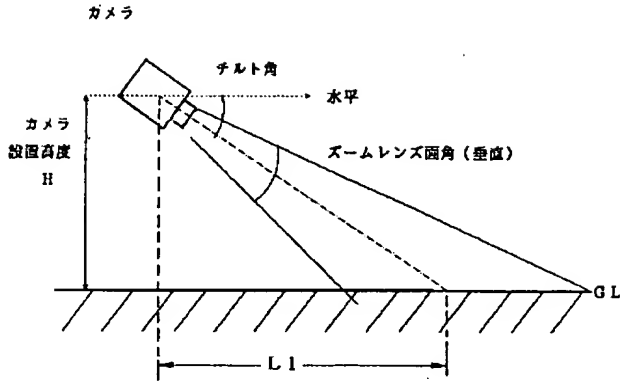


1　ＣＲＴ装置
2　地域情報入力手段（マウス）
3　演算制御装置
4　カメラ雲台
5　カメラ雲台制御装置
6　カメラ
8　記憶装置
9　映像合成装置

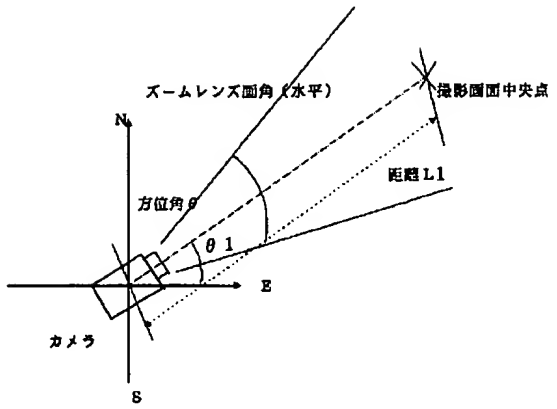
【図２】


S１
カメラの現在の指向方向及びズームレンズ比の数値を入力
S２
地図上からのカメラ制御指示の有無をチェック
指示無し
指示有り
S５
前回の数値入力値と今回の数値入力の変化有無をチェック
変化無し
変化有り
S３
制御指示の値とカメラの現在の指向方向、ズームレンズ比の偏差数値を演算
S６
指向方向、ズームレンズ比の偏差数値を演算
S８
ＣＲＴ装置の表示内容をそのままとする
S４
カメラの指向方向及びズームレンズ比の移動量をカメラ雲台制御装置に指示
S７
演算値を基に該当する地図情報を検索しＣＲＴ装置の地図情報を表示更新

【図３】

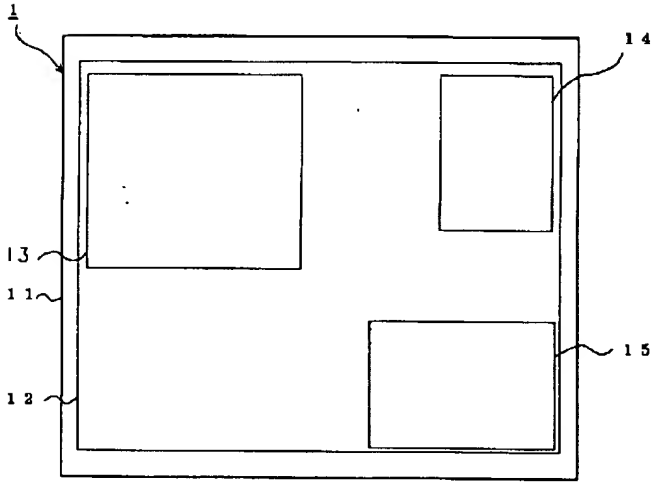


【図４】

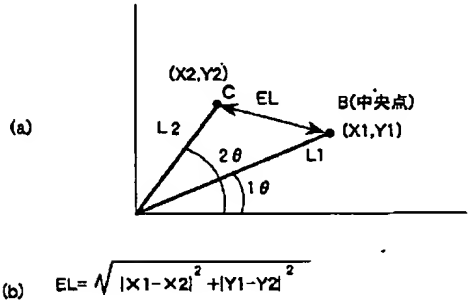


【図６】

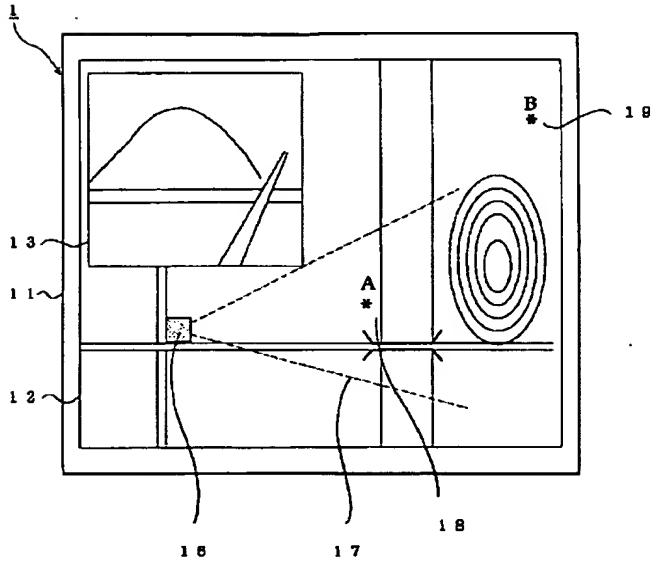
【図１１】



【図７】

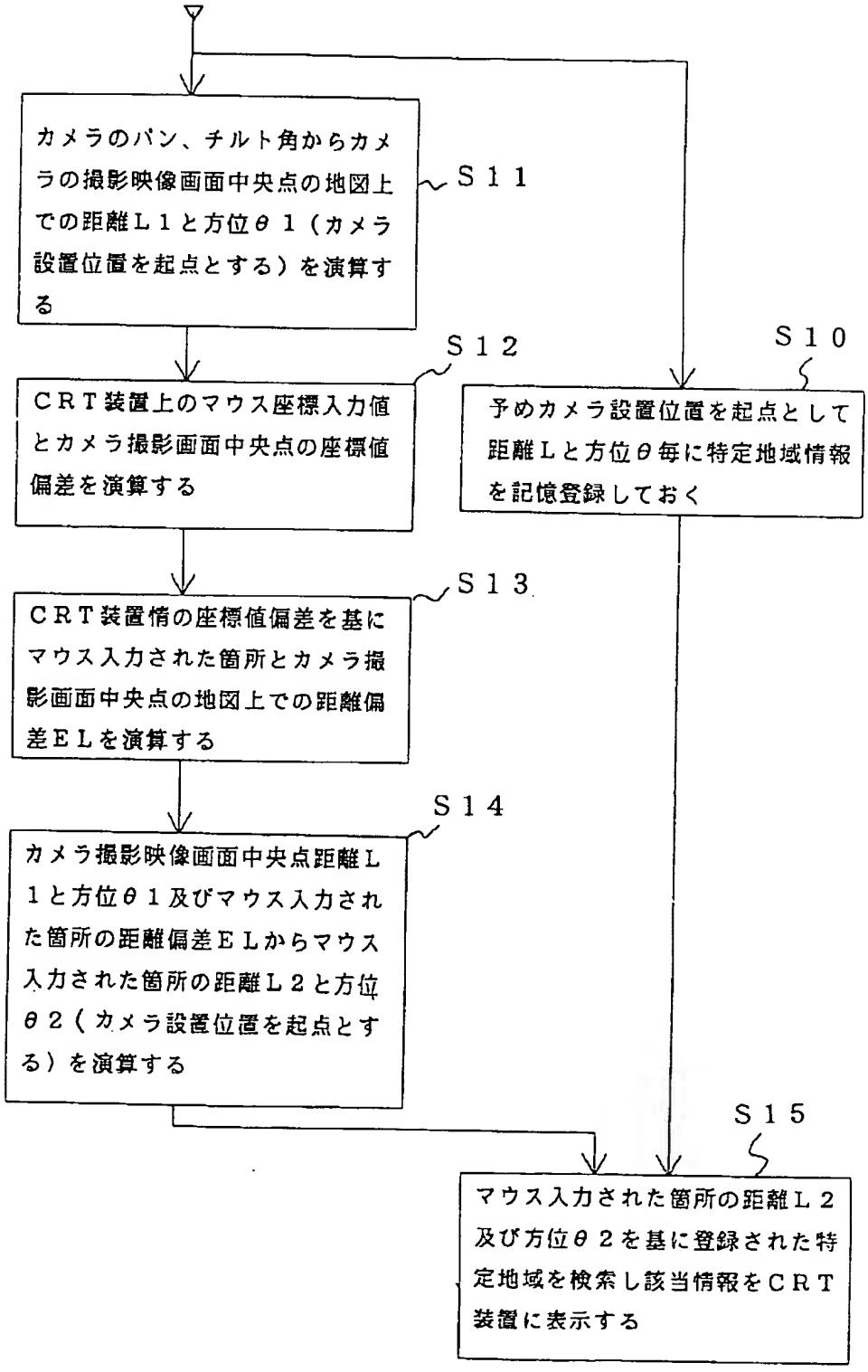


【図１３】

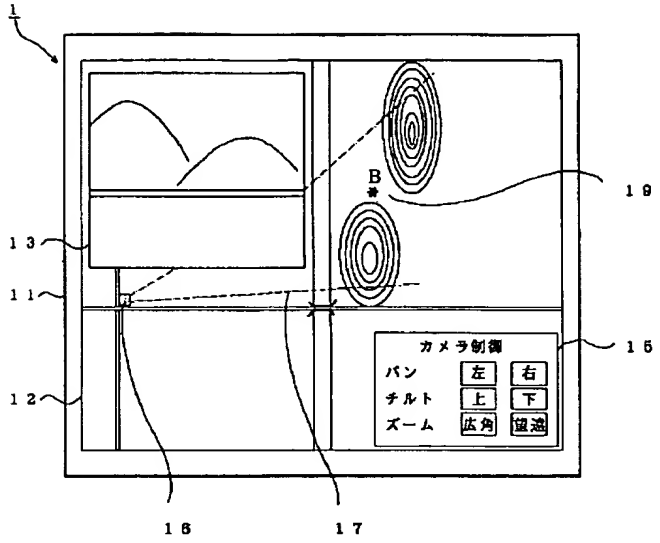


特定地域情報			L	θ
住所	TEL	氏名		
大町1の1	44-1234	田中	La	θa
大町1の2	44-5678	鈴木	Lb	θb
⋮	⋮	⋮	⋮	⋮

【図５】


カメラのパン、チルト角からカメラの撮影映像画面中央点の地図上での距離Ｌ１と方位θ１（カメラ設置位置を起点とする）を演算する
Ｓ１１
Ｓ１２
ＣＲＴ装置上のマウス座標入力値とカメラ撮影画面中央点の座標値偏差を演算する
Ｓ１０
予めカメラ設置位置を起点として距離Ｌと方位θ毎に特定地域情報を記憶登録しておく
Ｓ１３
ＣＲＴ装置情の座標値偏差を基にマウス入力された箇所とカメラ撮影画面中央点の地図上での距離偏差ＥＬを演算する
Ｓ１４
カメラ撮影映像画面中央点距離Ｌ１と方位θ１及びマウス入力された箇所の距離偏差ＥＬからマウス入力された箇所の距離Ｌ２と方位θ２（カメラ設置位置を起点とする）を演算する
Ｓ１５
マウス入力された箇所の距離Ｌ２及び方位θ２を基に登録された特定地域を検索し該当情報をＣＲＴ装置に表示する

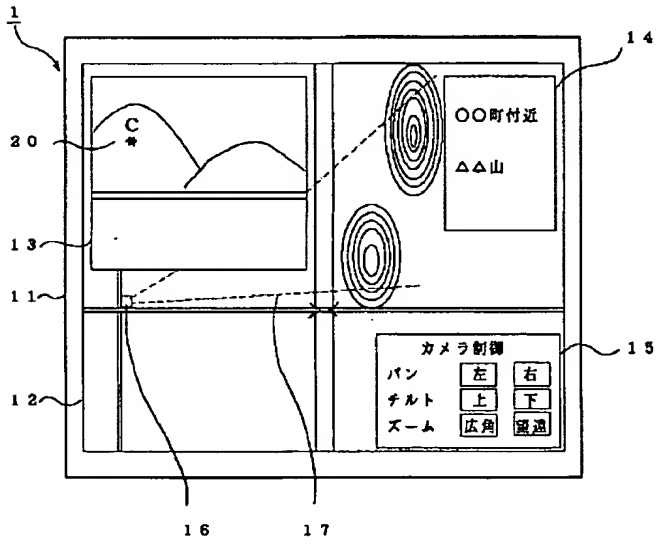
【図８】



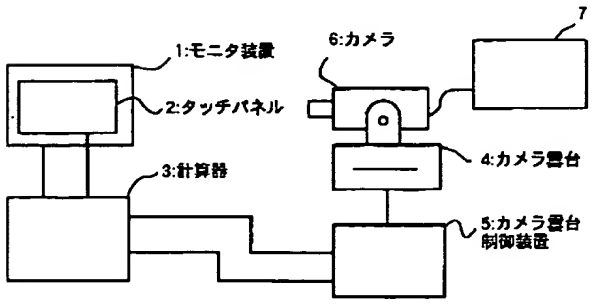
【図１４】

特定地域情報		L	θ
丁目	電柱番号		
1丁目	1	La	θa
1丁目	2	Lb	θb
1丁目	3	Lc	θc
2丁目	4	Ld	θd
⋮	⋮	⋮	⋮

【図９】



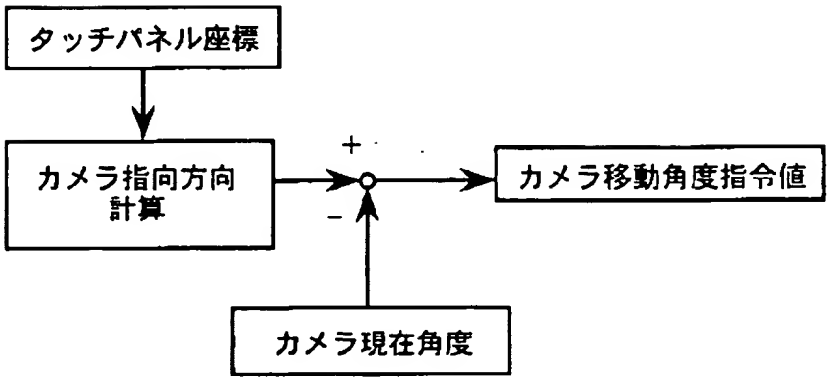
【図１５】



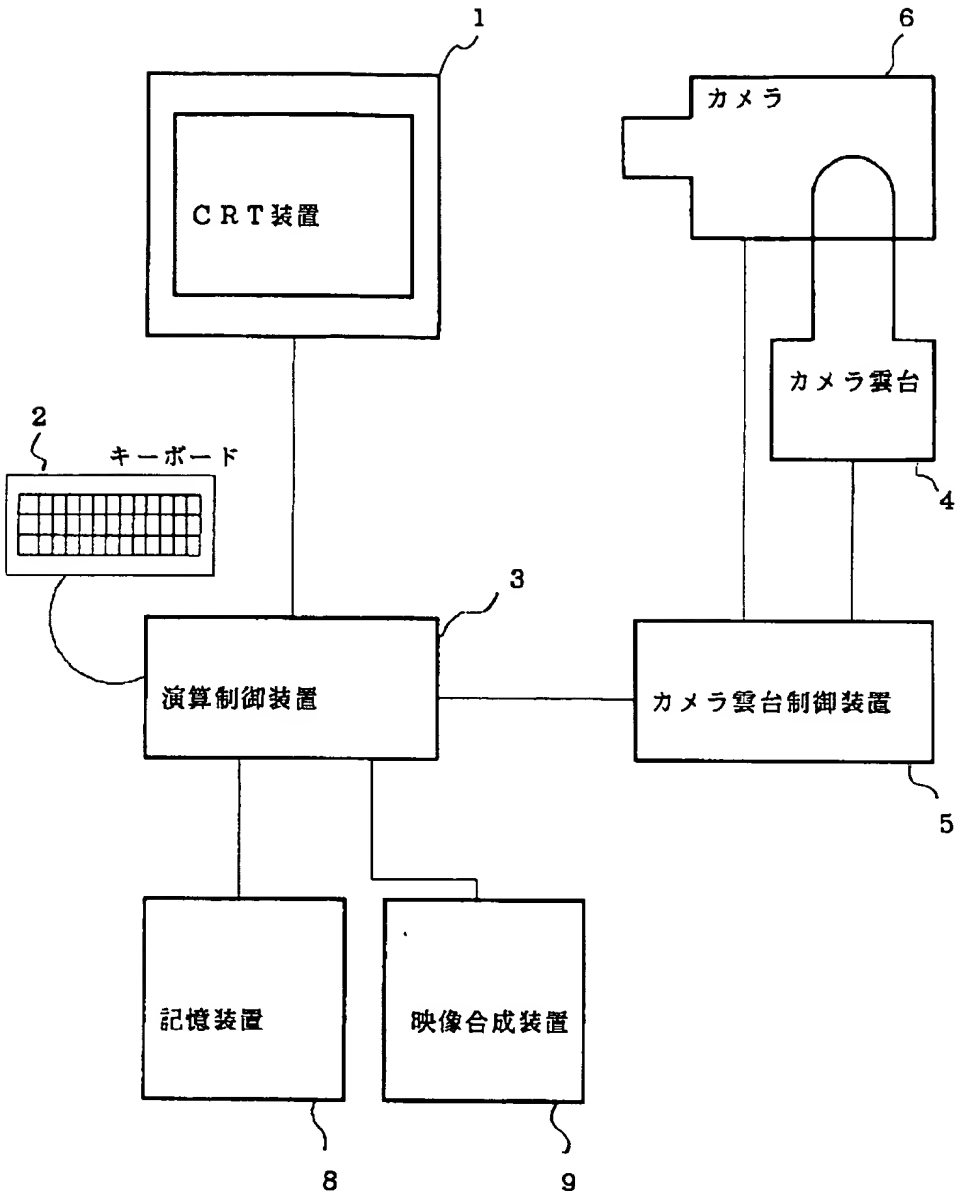
【図１０】

特定地域情報	L	θ
○○町付近　△△山	La	θa
○○町付近　××山	Lb	θb
××町付近　一川	Lc	θc
××町付近　第1ビル	Ld	θd
××町付近　東タワー	Le	θe
⋮	⋮	⋮

【図１６】



【図１２】


1
CRT装置
6
カメラ
カメラ雲台
4
2
キーボード
3
演算制御装置
カメラ雲台制御装置
5
記憶装置
映像合成装置
8
9

JP6-284330

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] A surveillance camera and the camera control unit which controls the above-mentioned surveillance camera based on camera control information, The storage which memorizes local information and map information, and the image synthesizer unit which compounds the computer image based on the local information and map information which were memorized by storage with the photography image of the above-mentioned surveillance camera, The display which displays the synthetic image compounded by the above-mentioned image synthesizer unit, Map information linkage monitor camera-control equipment characterized by consisting of arithmetic sequence units by which the above-mentioned storage was connected with a local information input means to input the specific part on a map, and the above-mentioned surveillance camera, the above-mentioned camera control unit, the above-mentioned display and the above-mentioned local information input means.
[Claim 2] A surveillance camera and the camera control unit which controls the above-mentioned surveillance camera based on camera control information, The display which displays the map of the storage which memorizes map information, and the location which the above-mentioned surveillance camera based on the above-mentioned map information is photoing, and the photography image of the above-mentioned surveillance camera, It consists of arithmetic sequence units by which the above-mentioned storage was connected with a local information input means to input the specific part on a map, and the above-mentioned surveillance camera, the above-mentioned camera control unit, the above-mentioned display and the above-mentioned local information input means. So that the specific part directed by directing the specific part on a map with the above-mentioned local information input means can be photoed in the magnitude (zoom ratio) of the photography screen where it was beforehand set to the above-mentioned surveillance camera Map information linkage monitor camera-control equipment characterized by for the above-mentioned arithmetic sequence unit calculating the zoom ratio of the above-mentioned surveillance camera, transmitting to the above-mentioned camera control unit by making these into camera control information, and controlling the above-mentioned surveillance camera.
[Claim 3] The above-mentioned arithmetic sequence unit is map information linkage monitor camera-control equipment according to claim 1 characterized by displaying the map of a suitable scale according to a zoom ratio on the above-mentioned display further based on the map information memorized by storage based on camera control information.
[Claim 4] A surveillance camera and the camera control unit which controls the above-mentioned surveillance camera based on camera control information, The display which displays the map of the storage which memorizes map information, and the location which the above-mentioned surveillance camera based on the above-mentioned map information is photoing, and the photography image of the above-mentioned surveillance camera, It consists of arithmetic sequence units by which the above-mentioned storage was connected with a local information input means to input the specific part on a map, and the above-mentioned surveillance camera, the above-mentioned camera control unit, the above-mentioned display and the above-mentioned local information input means. An arithmetic sequence unit is map information linkage monitor camera-control equipment which calculates the photographic coverage of the above-mentioned surveillance camera, and is characterized by displaying the mark which shows the calculated photographic coverage on the map displayed on the display.
[Claim 5] A surveillance camera, the camera control unit which controls the above-mentioned surveillance camera, and the storage which memorizes the local information related with map information and map information, The display which displays the map of the location which the above-mentioned surveillance camera is photoing based on the above-mentioned map information, and the photography image of the above-mentioned surveillance camera, It consists of arithmetic sequence units by which the above-mentioned storage was connected with a local information input means to input the above-mentioned local information, and the above-mentioned surveillance camera, the above-mentioned camera control unit, the above-mentioned display and the above-mentioned local information input means. By inputting the above-mentioned local information memorized by the above-mentioned storage with the above-mentioned local information input means Map information linkage monitor camera-control equipment with which the map information with which the above-mentioned arithmetic sequence unit was related from the above-mentioned storage based on the inputted local information is retrieved, and it is characterized by displaying the map based on the retrieved map information, or a photography image on the above-mentioned display.

[Claim 6] The above-mentioned map information linkage monitor camera-control equipment is map information linkage monitor camera-control equipment further characterized by displaying local information on a display.

TECHNICAL FIELD

[Industrial Application] This invention relates to the monitor camera-control equipment applied when displaying on a map the mark which shows camera photographic coverage, when carrying out the display output of the specific area information from a camera photography image, and when [the case where camera control information is inputted into the surveillance camera of a public building (for example, a road a dam, a river), and the fire-tower camera which supervises a city area, when searching the map of an applicable photography location from a photography image, or].

[Translation done.]

PRIOR ART

[Description of the Prior Art] Drawing 15 and drawing 16 are the block diagrams and control algorithms which show the conventional camera control unit shown in JP,4-169913,A. As for a calculator for the touch panel which outputs the coordinate signal which corresponds if the monitoring device with which 1 displays an object and the digital map of the neighborhood in drawing, and 2 are installed in the screen of a monitoring device and the location on a map is directed, and 3 to calculate the orientation of a camera from the coordinate signal from a touch panel, the camera universal head with which 4 supports a camera, the camera universal-head control unit with which 5 controls a camera universal head, and 6, a camera and 7 are the monitoring devices for camera photography graphic display.
[0003] Next, actuation is explained. An operator looks at the digital map displayed on the screen of a monitoring device 1, and if a desired location to turn a camera to by pushing the screen is specified, a coordinate signal will be inputted into a calculator 3 from a touch panel 2. A calculator 3 sends a deflection signal with the orientation include angle of a camera 6 to the camera universal-head control unit 5 with an input coordinate signal. The camera universal-head control unit 5 controls the camera universal head 4 according to an input, and controls it to turn a camera 6 to the location by which assignment was carried out [above-mentioned].

[Translation done.]

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Since the conventional camera control unit was constituted as mentioned above, the orientation (a pan, tilt) of a camera was calculated from the map information displayed on the monitor, and it was only controlling a camera. Since camera control was always possible only from a map, even if it was going to control the surveillance camera by this approach, the near object location needed to be got to know with the naked eye first, and camera actuation was not completed if the map information displayed on the monitor did not show an object location. Moreover, since use of a different scale map was not taken into consideration in case a map is displayed, in camera control, map gang control accompanying a zoom function was not completed. Thus, regardless of the expansion ratio of a photography image, since a display map was a fixed scale, the map of a photography object and its neighborhood was hard to look at it. Moreover, since the display function of the map which is related from the present camera pointing angle is not taken into consideration, a camera will be unknown [which is photoed on a map]. moreover, camera photographic coverage and the information on the specific area within a photography image — it cannot obtain -- further — moreover, a map display and a photography image are not on the same CRT, and there were troubles -- since it is displayed on separate CRT or a separate monitor, it is hard coming to see.

[0005] While it was made in order that this invention might cancel the above troubles, and a camera location can grasp on a map, the scale of a map indicates by adjustable according to the zoom ratio of a camera lens, the photography image of a map display and a camera which described the camera location on one set of a CRT monitor indicates by coincidence, and it aims at obtaining the equipment which can display a camera photography image on CRT from local information.

[Translation done.]

MEANS

[Means for Solving the Problem] The map information linkage camera control unit concerning this invention A surveillance camera and the camera universal-head control unit which controls the orientation (a pan, tilt) of the above-mentioned camera and the zoom ratio of a zoom lens, a focus, etc., The image synthesizer unit which compounds a computer image and a camera photography image, and the CRT equipment which indicates the object of the above-mentioned surveillance camera, the map of the neighborhood, and the photography image of the above-mentioned surveillance camera by coincidence on the same screen, The storage which memorizes, accumulates and reproduces a means to input local information, the map information on a different scale, and local information, It consists of arithmetic sequence units by which the above-mentioned storage was connected with the above-mentioned surveillance camera, the above-mentioned camera universal-head control unit, the above-mentioned image synthesizer unit, the above-mentioned CRT equipment, and the above-mentioned local information input means, and the above-mentioned CRT equipment is characterized by displaying the synthetic image compounded by the above-mentioned image synthesizer unit.
[0007] moreover, the thing for which the specific part on the map displayed on the above-mentioned CRT equipment is directed with the above-mentioned local information input means -- the orientation (a pan --) of the above-mentioned surveillance camera actual from the directions location on the above-mentioned CRT equipment photography is possible in the magnitude (zoom ratio) of the photography screen beforehand determined as the tilt -- as -- the zoom ratio and the focal value of the above-mentioned surveillance camera -- calculating -- these -- camera control information (a pan --) It is characterized by transmitting to the above-mentioned camera universal-head control unit as a tilt, a zoom ratio, etc., and controlling the above-mentioned surveillance camera.
[0008] Moreover, it is characterized by what the map information on a suitable scale according to a zoom ratio is retrieved with the map of the current photography object based on the camera control information (a pan, a tilt, zoom ratio, etc.) received from the above-mentioned camera universal-head control device, and its neighborhood from the above-mentioned storage, and is displayed on the above-mentioned CRT equipment.
[0009] Moreover, it is characterized by displaying the mark which shows the photographic coverage of the above-mentioned surveillance camera on map information.
[0010] Moreover, the above-mentioned arithmetic sequence unit is characterized by to retrieve the map information associated from the above-mentioned storage, and to display the map or the photography image based on the retrieved map information on the above-mentioned display based on the directed local information by directing the specific part or the local information on the above-mentioned surveillance camera photography image displayed on the above-mentioned CRT equipment with the above-mentioned local information input means.
[0011] Moreover, it is characterized by displaying the local information on the directed part on the above-mentioned CRT equipment.

[Translation done.]

OPERATION

[Function] The map information linkage monitor camera-control equipment concerning this invention compounds map information and a camera photography image with an image synthesizer unit, and displays map information and a camera photography image on one CRT equipment based on camera control information (a pan, a tilt, zoom lens ratio, etc.). Moreover, the orientation of a camera and a zoom lens ratio are controlled according to the directions location on a map. Moreover, based on the map information the storage means was remembered to be on the occasion of the map display, the map information on the optimal scale is retrieved and displayed according to a zoom lens ratio. Moreover, the photographic coverage of a camera is displayed on a map. Moreover, the map of the specified location is displayed by inputting local information, such as a specific location of a camera photography image or the address, and the telephone number. Moreover, in addition to the display of a map, specific area information is displayed.

[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention] As mentioned above, since according to this invention it is possible to always grasp the camera station of a camera, and use of a detailed map is possible according to a zoom lens ratio and it is possible to grasp the specific name of a place on an image etc., there is effectiveness of a person unfamiliar on the target map and a person unfamiliar to camera actuation also being able to use a surveillance camera effectively.

[Translation done.]

EXAMPLE

[Example] One example of this invention is explained about drawing below example 1. The same sign is given to the part to which drawing 15 corresponds in drawing 1 , and a comparable thing omits explanation functionally.
[0014] It is a local information input means by which 2 inputs the specific location of the map display on CRT equipment 1, or a camera photography image in drawing 1 . Indicate by retrieval the map information which corresponds from the current pointing angle and zoom lens ratio of a camera 6, or [that a mouse and 3 calculate the control value of a camera 6 in this example] The arithmetic sequence unit which performs retrieval presenting of specific area information, a camera with a zoom lens in 6, the storage which accumulated map information data and the specific area information on the scale from which 8 differs, and 9 are image synthesizer units which display a computer image and camera photography images, such as map information, on the same screen.
[0015] Drawing 2 is a camera control algorithm equivalent to drawing 16 .
[0016] Drawing 3 is a reference drawing explaining how to pinpoint the location of a photography point from the photography image of a camera, and is drawing which looked at camera equipment from the horizontal direction.
[0017] Drawing 4 is a reference drawing explaining how to pinpoint the location of a photography point from the photography image of a camera, and is drawing which looked at camera equipment from the vertical.
[0018] Drawing 5 is an algorithm for retrieving specific area information from the photography image of a camera.
[0019] Moreover, drawing 6 , drawing 7 , drawing 8 , and drawing 9 are drawings explaining the detail of this invention, and drawing 6 is the basic screen of CRT equipment 1 in these drawings. 11 the display frame of map information, and 13 for a display frame and 12 The display frame of a camera photography image, The boundary line in the display frame of local information and 15 the control display frame of a camera and 16 indicate the camera installation location on a map display, and 17 indicates [14] the photographic coverage of the camera on a map display to be, and 18, 29 and 20 show the location directed with the mouse 2 on the map display or the camera photography image.
[0020] Next, actuation is explained. It unites with a camera universal head, and fixed installation is carried out and, generally the various following control is possible for a camera 6 by the command from the outside. A camera level include angle (pan), a camera perpendicular include angle (tilt), a zoom, etc. In addition, although control of a focus, a diaphragm, a dew condensation prevention heater, a wiper, etc. is also possible in addition to this to a camera, since it is unrelated to this invention, these explanation is omitted.
[0021] Drawing 2 is a flow chart which shows the camera control algorithm based on this example. In this example, an arithmetic sequence unit 3 inputs the condition of a camera periodically from the camera universal-head control unit 5. Although an arithmetic sequence unit 3 can control a camera by calculating camera control information (a pan, a tilt, zoom ratio, etc.), and transmitting to the camera universal-head control unit 5 in order to control a camera, it may be said that the camera itself and the camera universal-head control unit itself generate camera control information, or it operates based on the camera control information sent from the arithmetic sequence unit 3. Therefore, the camera control unit 3 checks the current condition of a camera universal-head control unit to a camera by the time amount of arbitration periodically from the camera universal-head control unit 5. The flow chart shown in drawing 2 is performed whenever an arithmetic sequence unit inputs the condition of a camera from a camera universal-head control unit.
[0022] In S1, an arithmetic sequence unit 3 inputs the current orientation of a camera, and the numeric value of a zoom lens ratio from the camera universal-head control unit 5 first. Next, it is confirmed whether three has camera control lead from the map with which the operator was displayed on the CRT equipment value using the local information input means 2, such as a mouse, in an arithmetic sequence unitS2. When the specific part on a map is specified with a mouse etc., the value of control lead based on the specific part specified in S3, and the current orientation of the camera inputted from the camera universal-head control unit 5 in S1 and the deflection numeric value of a zoom lens ratio are calculated.
[0023] Next, in S4, an arithmetic sequence unit 3 sends out the orientation of a camera, and the movement magnitude of a zoom lens ratio to the camera universal-head control unit 5 based on the deflection numeric value calculated and calculated. The camera universal-head control unit 5 receives such camera control information from an arithmetic sequence unit 3, and controls a camera in the condition of having been specified. In S2 mentioned above, from a mouse etc., when there is no camera control lead, in S5, an arithmetic sequence unit 3 checks change with the numeric value of the orientation of the last camera memorized beforehand, and a zoom lens ratio, and this numeric value. When the last numeric value and this numeric value have change, in S6, the deflection numeric value of orientation and a zoom lens ratio is calculated. And in S7, based on the calculated deflection numeric value, the map information memorized by storage is retrieved and a map is displayed on CRT equipment from the retrieved map information.

camera is photoing will be displayed on CRT equipment.
[0025] In S5 mentioned above, since the camera will photo the same location when there is no change in the last numeric value and this numeric value, in S8, the contents of a display of CRT equipment remain as it is, and the same map information continues being displayed.
[0026] An operator operates it using the mouse 2 and CRT1 which are connected to an arithmetic sequence unit 3. Drawing 6 is the basic screen of CRT equipment 1, when various display frames need the function applicable to it, it is displayed, and this display control is performed by the arithmetic sequence unit 3.
[0027] Drawing 7 is the screen which described the concrete contents of a display in the basic screen of drawing 6 . In drawing 7 , 12 is the display frame of map information and is the boundary line which shows the photographic coverage 17 of the camera installation location 16 or a camera on a map, and the example of a screen as which the display frame 13 with which the video image which the present camera is photoing was displayed was displayed on this. The image synthesizer unit 9 is performing the function which displays a computer image and video images, such as map information, on the same screen.
[0028] Since a camera is fixed installation in this drawing, the camera installation location 16 performs a display on a map by registering with an arithmetic sequence unit 3 beforehand. Moreover, the boundary line which shows the photographic coverage 17 of a camera inputs the information which shows the camera level include angle (pan) of a camera, a camera perpendicular include angle (tilt), and a zoom from the camera universal-head control unit 5, and displays by calculating from the scale of the installation altitude value of this and the camera registered beforehand, and a display map. The boundary line which shows the photographic coverage 17 of this camera is generated as a computer image, and is displayed on the same screen with computer images, such as other map information, with the image synthesizer unit 9.
[0029] In drawing 7 , an operator can acquire the boundary line 17 and camera photography image which show the map display and camera photographic coverage according to the orientation and the zoom ratio of a camera present in a map top on the same CRT equipment 1. Since drawing 7 is an example of a CRT screen centering on the arbitration point 18, it explains below the case where camera control is carried out to the arbitration point 19 from the arbitration point 18.
[0030] In drawing 7 , by directing the arbitration location 19 on a map with a mouse 2, the camera zoom ratio which can grasp the circumference of the bias and the arbitration location 19 with the present orientation of a camera based on the CRT coordinate location inputted from a mouse 2 is calculated, the delivery camera 6 and the camera universal head 4 are controlled to a camera universal-head control unit, and the arbitration location 19 and the photography image of the circumference of it are acquired in this with an arithmetic sequence unit 3. The map of a suitable scale is searched by the camera zoom ratio to coincidence, and it is made to display on CRT equipment 1. Moreover, it is made to display on the map which calculated the boundary line which shows the photographic coverage 17 of a camera, and indicated by retrieval newly from the scale of the camera level include angle (pan), the camera perpendicular include angle (tilt), the zoom information and this of the camera corresponding to the arbitration point 19, the installation altitude value of the camera registered beforehand, and a display map. The example of a CRT screen of the result of having performed processing of this is drawing 8 .
[0031] Drawing 8 is the example by which a coincidence indication also of the control display frame 15 of a camera was given. It is also possible to control without directing a map location for a camera 6 using the control display frame 15 of this camera. For example, by directing the "left" of the pan of the control display frame 15 of a camera with a mouse 2, the control signal which rotates a camera 6 leftward is passed to the camera universal-head control unit 5 with an arithmetic sequence unit 3. The boundary line which shows the photographic coverage 17 of the other camera installation locations 16 or a camera is as having explained above. If it becomes impossible for the photographic coverage of a camera to display on a map current on display at this time, the suitable map information will be indicated by retrieval from storage 3, and the photographic coverage 17 of the camera installation location 16 or a camera will be re-calculated and displayed on this map.
[0032] By directing the arbitration point 20 on the image of the camera photography graphic display frame 13, drawing 9 is the example of a screen which displayed the local information registered into this point on the display frame 14 of local information. The detail of this display function is explained below. The arbitration point 20 of the camera photography graphic display frame 13 is inputted into the operation display 3 with the coordinate on CRT equipment 1. The coordinate (for example, an include angle and distance centering on the camera installation location 16) of the point which it is displayed from the pan of a camera, a tilt angle, and a zoom lens ratio now, and was specified with the mouse 2 is searched for with the algorithm of drawing 5 , the specific area information beforehand registered based on this coordinate is retrieved in an operation indicating equipment, and it is made to display on CRT equipment 1. By finding the include angle centering on a camera installation location, and distance, drawing 5 is an algorithm for searching for specific area information by making this into a search key, and explains the method which calculates the include angle of the location directed with the mouse after calculating the location on the map of the center point of a camera photography screen, and distance. Drawing 3 and drawing 4 are the reference drawings for calculating the map top location of the center point of a camera photography screen, and it is shown that an operation is possible for the center point at the installation altitude of a camera, a pan, a tilt angle, and a zoom lens ratio.
[0033] Next, the operation approach of the deflection numeric value of the present orientation approach performed when there are directions of specific parts, such as a mouse in S3 of drawing 2 mentioned above, based on the flow chart of drawing 5 is explained. In addition to the operation of a deflection numeric value, the flow chart of drawing 5 has described how to retrieve specific area information, doubles both and is explained here.
[0034] In S10 of drawing 5 , specific area information is beforehand recorded on storage with the camera installation location as the starting point at every distance L and bearing theta. Drawing 10 is drawing showing an example of

the specific area information memorized by storage. As specific area information, local information, such as an identifier of a town, an identifier of a crest, an identifier of a river, an identifier of a building, and an identifier of a tower, is recorded, and in order to show the location where such local information exists, the distance L and Bearing theta on the basis of a camera installation location are recorded, respectively. Thus, where the specific area information shown in drawing 10 is recorded on a recording device, as it was shown in drawing 9 , the case where the arbitration point 20 is directed is explained.

[0035] First, the screen center point of a current camera is calculated in S11. Drawing 11 is drawing showing this actuation, and assumes that it is that whose point B is the center point of the present camera. This center point B shall have the coordinate of X1 and Y1 on an axis of coordinates. The distance L1 and bearing theta 1 on the map of the photography image screen center point of a camera are called for from the pan of a camera, and a tilt angle as a value which shows the center point. Next, in S12, the coordinate input value of the specified arbitration point and the coordinate value deflection of the camera photography screen center point are calculated. In drawing 11 , Point C is assumed to be the arbitration point 20 specified with the mouse. The mouse coordinate input value of this point C is set to X2 and Y2. Therefore, a mouse coordinate input value and the coordinate value of the camera photography screen center point are set to X1, Y1, and X2 and Y2, respectively, and X1-X2 and Y1-Y2 ask for each deflection. Next, in S13, the distance deflection PL on the map of the mouse input part based on the coordinate value deflection for which it asked, and the camera photography screen center point is calculated. PL is calculated by the square root of the square of the absolute value of the difference of X coordinate, and the square of the absolute value of the difference of Y coordinate, as shown in drawing 11 (b). Next, L2 and bearing theta 2 of a part by which the mouse input was carried out from the distance L1 of the image screen center point, bearing theta 1, and the distance deflection PL which were mentioned above in S14 are calculated. Next, in S15, the specific area information shown in drawing 10 based on the distance L2 and bearing theta 2 of the arbitration point C which were called for is retrieved. When searching, specific area information with the value nearest to distance L2 and bearing theta 2 is retrieved, and it is displayed on CRT equipment. For example, when it is judged that the distance L2 and bearing theta 2 in drawing 11 are the closest to the distance LA in drawing 10 and bearing thetaA, as shown in 14 of drawing 9 , the specific area information near OO town and of **** crest is displayed as specific area information.

[0036] The configuration of other examples is shown in example 2., next drawing 12 . The example shown in drawing 12 adds a keyboard as an alternative of the mouse shown by drawing 1 about the local information input means. From a keyboard, the specific location on CRT equipment 1 can be directed by moving cursor. Moreover, it is possible to input alphabetic data, such as local information, for example, the address, and the telephone number, into an arithmetic sequence unit 3. Although the example 1 showed the case where a cursor coordinate location was inputted, it is possible to also make the orientation and the zoom of a camera control from data, such as the address and the telephone number.

[0037] Drawing 13 is drawing showing an example of the local information by this example. In drawing 13 , the case where the address, the telephone number, and a name are used as specific area information is shown. For example, when the address is inputted from a keyboard, the distance L and Bearing theta applicable to the address are searched. With the telephone number, distance L and Bearing theta can be searched similarly. Furthermore, even if it uses a name, distance L and Bearing theta can be searched.

[0038] Moreover, drawing 14 is drawing showing other examples of local information, and shows the case where a telegraph pole number is used as specific area information. For example, it is possible by specifying the telegraph pole number 1 to search the distance L in which the telegraph pole exists, and Bearing theta. Moreover, the identifier of a town may be used as specific area information like drawing 10 shown in the example mentioned above. Or you may make it use the identifier of a building, the identifier of a crest, etc. as specific area information.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the monitor camera-control equipment applied when displaying on a map the mark which shows camera photographic coverage, when carrying out the display output of the specific area information from a camera photography image, and when [the case where camera control information is inputted into the surveillance camera of a public building (for example, a road a dam, a river), and the fire-tower camera which supervises a city area, when searching the map of an applicable photography location from a photography image, or].
[0002]
[Description of the Prior Art] Drawing 15 and drawing 16 are the block diagrams and control algorithms which show the conventional camera control unit shown in JP,4-169913,A. As for a calculator for the touch panel which outputs the coordinate signal which corresponds if the monitoring device with which 1 displays an object and the digital map of the neighborhood in drawing, and 2 are installed in the screen of a monitoring device and the location on a map is directed, and 3 to calculate the orientation of a camera from the coordinate signal from a touch panel, the camera universal head with which 4 supports a camera, the camera universal-head control unit with which 5 controls a camera universal head, and 6, a camera and 7 are the monitoring devices for camera photography graphic display.
[0003] Next, actuation is explained. An operator looks at the digital map displayed on the screen of a monitoring device 1, and if a desired location to turn a camera to by pushing the screen is specified, a coordinate signal will be inputted into a calculator 3 from a touch panel 2. A calculator 3 sends a deflection signal with the orientation include angle of a camera 6 to the camera universal-head control unit 5 with an input coordinate signal. The camera universal-head control unit 5 controls the camera universal head 4 according to an input, and controls it to turn a camera 6 to the location by which assignment was carried out [above-mentioned].
[0004]
[Problem(s) to be Solved by the Invention] Since the conventional camera control unit was constituted as mentioned above, the orientation (a pan, tilt) of a camera was calculated from the map information displayed on the monitor, and it was only controlling a camera. Since camera control was always possible only from a map, even if it was going to control the surveillance camera by this approach, the near object location needed to be got to know with the naked eye first, and camera actuation was not completed if the map information displayed on the monitor did not show an object location. Moreover, since use of a different scale map was not taken into consideration in case a map is displayed, in camera control, map gang control accompanying a zoom function was not completed. Thus, regardless of the expansion ratio of a photography image, since a display map was a fixed scale, the map of a photography object and its neighborhood was hard to look at it. Moreover, since the display function of the map which is related from the present camera pointing angle is not taken into consideration, a camera will be unknown [which is photoed on a map]. moreover, camera photographic coverage and the information on the specific area within a photography image — it cannot obtain — further — moreover, a map display and a photography image are not on the same CRT, and there were troubles — since it is displayed on separate CRT or a separate monitor, it is hard coming to see.
[0005] While it was made in order that this invention might cancel the above troubles, and a camera location can grasp on a map, the scale of a map indicates by adjustable according to the zoom ratio of a camera lens, the photography image of a map display and a camera which described the camera location on one set of a CRT monitor indicates by coincidence, and it aims at obtaining the equipment which can display a camera photography image on CRT from local information.
[0006]
[Means for Solving the Problem] The map information linkage camera control unit concerning this invention A surveillance camera and the camera universal-head control unit which controls the orientation (a pan, tilt) of the above-mentioned camera and the zoom ratio of a zoom lens, a focus, etc., The image synthesizer unit which compounds a computer image and a camera photography image, and the CRT equipment which indicates the object of the above-mentioned surveillance camera, the map of the neighborhood, and the photography image of the above-mentioned surveillance camera by coincidence on the same screen, The storage which memorizes, accumulates and reproduces a means to input local information, the map information on a different scale, and local information, It consists of arithmetic sequence units by which the above-mentioned storage was connected with the above-mentioned surveillance camera, the above-mentioned camera universal-head control unit, the above-mentioned image synthesizer unit, the above-mentioned CRT equipment, and the above-mentioned local information input means, and the above-mentioned CRT equipment is characterized by displaying the synthetic image

[0007] moreover, the thing for which the specific part on the map displayed on the above-mentioned CRT equipment is directed with the above-mentioned local information input means — the orientation (a pan —) of the above-mentioned surveillance camera actual from the directions location on the above-mentioned CRT equipment photography is possible in the magnitude (zoom ratio) of the photography screen beforehand determined as the tilt — as — the zoom ratio and the focal value of the above-mentioned surveillance camera — calculating — these — camera control information (a pan —) It is characterized by transmitting to the above-mentioned camera universal-head control unit as a tilt, a zoom ratio, etc., and controlling the above-mentioned surveillance camera.
[0008] Moreover, it is characterized by what the map information on a suitable scale according to a zoom ratio is retrieved with the map of the current photography object based on the camera control information (a pan, a tilt, zoom ratio, etc.) received from the above-mentioned camera universal-head control device, and its neighborhood from the above-mentioned storage, and is displayed on the above-mentioned CRT equipment.
[0009] Moreover, it is characterized by displaying the mark which shows the photographic coverage of the above-mentioned surveillance camera on map information.
[0010] Moreover, the above-mentioned arithmetic sequence unit is characterized by to retrieve the map information associated from the above-mentioned storage, and to display the map or the photography image based on the retrieved map information on the above-mentioned display based on the directed local information by directing the specific part or the local information on the above-mentioned surveillance camera photography image displayed on the above-mentioned CRT equipment with the above-mentioned local information input means.
[0011] Moreover, it is characterized by displaying the local information on the directed part on the above-mentioned CRT equipment.
[0012]
[Function] The map information linkage monitor camera-control equipment concerning this invention compounds map information and a camera photography image with an image synthesizer unit, and displays map information and a camera photography image on one CRT equipment based on camera control information (a pan, a tilt, zoom lens ratio, etc.). Moreover, the orientation of a camera and a zoom lens ratio are controlled according to the directions location on a map. Moreover, based on the map information the storage means was remembered to be on the occasion of the map display, the map information on the optimal scale is retrieved and displayed according to a zoom lens ratio. Moreover, the photographic coverage of a camera is displayed on a map. Moreover, the map of the specified location is displayed by inputting local information, such as a specific location of a camera photography image or the address, and the telephone number. Moreover, in addition to the display of a map, specific area information is displayed.
[0013]
[Example] One example of this invention is explained about drawing below example 1. The same sign is given to the part to which drawing 15 corresponds in drawing 1 , and a comparable thing omits explanation functionally.
[0014] It is a local information input means by which 2 inputs the specific location of the map display on CRT equipment 1, or a camera photography image in drawing 1 . Indicate by retrieval the map information which corresponds from the current pointing angle and zoom lens ratio of a camera 6, or [that a mouse and 3 calculate the control value of a camera 6 in this example] The arithmetic sequence unit which performs retrieval presenting of specific area information, a camera with a zoom lens in 6, the storage which accumulated map information data and the specific area information on the scale from which 8 differs, and 9 are image synthesizer units which display a computer image and camera photography images, such as map information, on the same screen.
[0015] Drawing 2 is a camera control algorithm equivalent to drawing 16 .
[0016] Drawing 3 is a reference drawing explaining how to pinpoint the location of a photography point from the photography image of a camera, and is drawing which looked at camera equipment from the horizontal direction.
[0017] Drawing 4 is a reference drawing explaining how to pinpoint the location of a photography point from the photography image of a camera, and is drawing which looked at camera equipment from the vertical.
[0018] Drawing 5 is an algorithm for retrieving specific area information from the photography image of a camera.
[0019] Moreover, drawing 6 , drawing 7 , drawing 8 , and drawing 9 are drawings explaining the detail of this invention, and drawing 6 is the basic screen of CRT equipment 1 in these drawings. 11 the display frame of map information, and 13 for a display frame and 12 The display frame of a camera photography image, The boundary line in the display frame of local information and 15 the control display frame of a camera and 16 indicate the camera installation location on a map display, and 17 indicates [14] the photographic coverage of the camera on a map display to be, and 18, 29 and 20 show the location directed with the mouse 2 on the map display or the camera photography image.
[0020] Next, actuation is explained. It unites with a camera universal head, and fixed installation is carried out and, generally the various following control is possible for a camera 6 by the command from the outside. A camera level include angle (pan), a camera perpendicular include angle (tilt), a zoom, etc. In addition, although control of a focus, a diaphragm, a dew condensation prevention heater, a wiper, etc. is also possible in addition to this to a camera, since it is unrelated to this invention, these explanation is omitted.
[0021] Drawing 2 is a flow chart which shows the camera control algorithm based on this example. In this example, an arithmetic sequence unit 3 inputs the condition of a camera periodically from the camera universal-head control unit 5. Although an arithmetic sequence unit 3 can control a camera by calculating camera control information (a pan, a tilt, zoom ratio, etc.), and transmitting to the camera universal-head control unit 5 in order to control a camera, it may be said that the camera itself and the camera universal-head control unit itself generate camera control information, or it operates based on the camera control information sent from the arithmetic sequence unit 3. Therefore, the camera control unit 3 checks the current condition of a camera universal-head control unit to a camera by the time amount of arbitration periodically from the camera universal-head control unit 5. The flow chart

shown in drawing 2 is performed whenever an arithmetic sequence unit inputs the condition of a camera from a camera universal-head control unit.

[0022] In S1, an arithmetic sequence unit 3 inputs the current orientation of a camera, and the numeric value of a zoom lens ratio from the camera universal-head control unit 5 first. Next, it is confirmed whether three has camera control lead from the map with which the operator was displayed on the CRT equipment value using the local information input means 2, such as a mouse, in an arithmetic sequence unitS2. When the specific part on a map is specified with a mouse etc., the value of control lead based on the specific part specified in S3, and the current orientation of the camera inputted from the camera universal-head control unit 5 in S1 and the deflection numeric value of a zoom lens ratio are calculated.

[0023] Next, in S4, an arithmetic sequence unit 3 sends out the orientation of a camera, and the movement magnitude of a zoom lens ratio to the camera universal-head control unit 5 based on the deflection numeric value calculated and calculated. The camera universal-head control unit 5 receives such camera control information from an arithmetic sequence unit 3, and controls a camera in the condition of having been specified. In S2 mentioned above, from a mouse etc., when there is no camera control lead, in S5, an arithmetic sequence unit 3 checks change with the numeric value of the orientation of the last camera memorized beforehand, and a zoom lens ratio, and this numeric value. When the last numeric value and this numeric value have change, in S6, the deflection numeric value of orientation and a zoom lens ratio is calculated. And in S7, based on the calculated deflection numeric value, the map information memorized by storage is retrieved and a map is displayed on CRT equipment from the retrieved map information.

[0024] Thus, by passing through the step of S5 to S7, the map information about the newest image which the camera is photoing will be displayed on CRT equipment.

[0025] In S5 mentioned above, since the camera will photo the same location when there is no change in the last numeric value and this numeric value, in S8, the contents of a display of CRT equipment remain as it is, and the same map information continues being displayed.

[0026] An operator operates it using the mouse 2 and CRT1 which are connected to an arithmetic sequence unit 3. Drawing 6 is the basic screen of CRT equipment 1, when various display frames need the function applicable to it, it is displayed, and this display control is performed by the arithmetic sequence unit 3.

[0027] Drawing 7 is the screen which described the concrete contents of a display in the basic screen of drawing 6 . In drawing 7 , 12 is the display frame of map information and is the boundary line which shows the photographic coverage 17 of the camera installation location 16 or a camera on a map, and the example of a screen as which the display frame 13 with which the video image which the present camera is photoing was displayed was displayed on this. The image synthesizer unit 9 is performing the function which displays a computer image and video images, such as map information, on the same screen.

[0028] Since a camera is fixed installation in this drawing, the camera installation location 16 performs a display on a map by registering with an arithmetic sequence unit 3 beforehand. Moreover, the boundary line which shows the photographic coverage 17 of a camera inputs the information which shows the camera level include angle (pan) of a camera, a camera perpendicular include angle (tilt), and a zoom from the camera universal-head control unit 5, and displays by calculating from the scale of the installation altitude value of this and the camera registered beforehand, and a display map. The boundary line which shows the photographic coverage 17 of this camera is generated as a computer image, and is displayed on the same screen with computer images, such as other map information, with the image synthesizer unit 9.

[0029] In drawing 7 , an operator can acquire the boundary line 17 and camera photography image which show the map display and camera photographic coverage according to the orientation and the zoom ratio of a camera present in a map top on the same CRT equipment 1. Since drawing 7 is an example of a CRT screen centering on the arbitration point 18, it explains below the case where camera control is carried out to the arbitration point 19 from the arbitration point 18.

[0030] In drawing 7 , by directing the arbitration location 19 on a map with a mouse 2, the camera zoom ratio which can grasp the circumference of the bias and the arbitration location 19 with the present orientation of a camera based on the CRT coordinate location inputted from a mouse 2 is calculated, the delivery camera 6 and the camera universal head 4 are controlled to a camera universal-head control unit, and the arbitration location 19 and the photography image of the circumference of it are acquired in this with an arithmetic sequence unit 3. The map of a suitable scale is searched by the camera zoom ratio to coincidence, and it is made to display on CRT equipment 1. Moreover, it is made to display on the map which calculated the boundary line which shows the photographic coverage 17 of a camera, and indicated by retrieval newly from the scale of the camera level include angle (pan), the camera perpendicular include angle (tilt), the zoom information and this of the camera corresponding to the arbitration point 19, the installation altitude value of the camera registered beforehand, and a display map. The example of a CRT screen of the result of having performed processing of this is drawing 8 .

[0031] Drawing 8 is the example by which a coincidence indication also of the control display frame 15 of a camera was given. It is also possible to control without directing a map location for a camera 6 using the control display frame 15 of this camera. For example, by directing the "left" of the pan of the control display frame 15 of a camera with a mouse 2, the control signal which rotates a camera 6 leftward is passed to the camera universal-head control unit 5 with an arithmetic sequence unit 3. The boundary line which shows the photographic coverage 17 of the other camera installation locations 16 or a camera is as having explained above. If it becomes impossible for the photographic coverage of a camera to display on a map current on display at this time, the suitable map information will be indicated by retrieval from storage 3, and the photographic coverage 17 of the camera installation location 16 or a camera will be re-calculated and displayed on this map.

[0032] By directing the arbitration point 20 on the image of the camera photography graphic display frame 12

drawing 9 is the example of a screen which displayed the local information registered into this point on the display frame 14 of local information. The detail of this display function is explained below. The arbitration point 20 of the camera photography graphic display frame 13 is inputted into the operation display 3 with the coordinate on CRT equipment 1. The coordinate (for example, an include angle and distance centering on the camera installation location 16) of the point which it is displayed from the pan of a camera, a tilt angle, and a zoom lens ratio now, and was specified with the mouse 2 is searched for with the algorithm of drawing 5 , the specific area information beforehand registered based on this coordinate is retrieved in an operation indicating equipment, and it is made to display on CRT equipment 1. By finding the include angle centering on a camera installation location, and distance, drawing 5 is an algorithm for searching for specific area information by making this into a search key, and explains the method which calculates the include angle of the location directed with the mouse after calculating the location on the map of the center point of a camera photography screen, and distance. Drawing 3 and drawing 4 are the reference drawings for calculating the map top location of the center point of a camera photography screen, and it is shown that an operation is possible for the center point at the installation altitude of a camera, a pan, a tilt angle, and a zoom lens ratio.

[0033] Next, the operation approach of the deflection numeric value of the present orientation approach performed when there are directions of specific parts, such as a mouse in S3 of drawing 2 mentioned above, based on the flow chart of drawing 5 is explained. In addition to the operation of a deflection numeric value, the flow chart of drawing 5 has described how to retrieve specific area information, doubles both and is explained here.

[0034] In S10 of drawing 5 , specific area information is beforehand recorded on storage with the camera installation location as the starting point at every distance L and bearing theta. Drawing 10 is drawing showing an example of the specific area information memorized by storage. As specific area information, local information, such as an identifier of a town, an identifier of a crest, an identifier of a river, an identifier of a building, and an identifier of a tower, is recorded, and in order to show the location where such local information exists, the distance L and Bearing theta on the basis of a camera installation location are recorded, respectively. Thus, where the specific area information shown in drawing 10 is recorded on a recording device, as it was shown in drawing 9 , the case where the arbitration point 20 is directed is explained.

[0035] First, the screen center point of a current camera is calculated in S11. Drawing 11 is drawing showing this actuation, and assumes that it is that whose point B is the center point of the present camera. This center point B shall have the coordinate of X1 and Y1 on an axis of coordinates. The distance L1 and bearing theta 1 on the map of the photography image screen center point of a camera are called for from the pan of a camera, and a tilt angle as a value which shows the center point. Next, in S12, the coordinate input value of the specified arbitration point and the coordinate value deflection of the camera photography screen center point are calculated. In drawing 11 , Point C is assumed to be the arbitration point 20 specified with the mouse. The mouse coordinate input value of this point C is set to X2 and Y2. Therefore, a mouse coordinate input value and the coordinate value of the camera photography screen center point are set to X1, Y1, and X2 and Y2, respectively, and X1−X2 and Y1−Y2 ask for each deflection. Next, in S13, the distance deflection PL on the map of the mouse input part based on the coordinate value deflection for which it asked, and the camera photography screen center point is calculated. PL is calculated by the square root of the square of the absolute value of the difference of X coordinate, and the square of the absolute value of the difference of Y coordinate, as shown in drawing 11 (b). Next, L2 and bearing theta 2 of a part by which the mouse input was carried out from the distance L1 of the image screen center point, bearing theta 1, and the distance deflection PL which were mentioned above in S14 are calculated. Next, in S15, the specific area information shown in drawing 10 based on the distance L2 and bearing theta 2 of the arbitration point C which were called for is retrieved. When searching, specific area information with the value nearest to distance L2 and bearing theta 2 is retrieved, and it is displayed on CRT equipment. For example, when it is judged that the distance L2 and bearing theta 2 in drawing 11 are the closest to the distance LA in drawing 10 and bearing thetaA, as shown in 14 of drawing 9 , the specific area information near OO town and of **** crest is displayed as specific area information.

[0036] The configuration of other examples is shown in example 2., next drawing 12 . The example shown in drawing 12 adds a keyboard as an alternative of the mouse shown by drawing 1 about the local information input means. From a keyboard, the specific location on CRT equipment 1 can be directed by moving cursor. Moreover, it is possible to input alphabetic data, such as local information, for example, the address, and the telephone number, into an arithmetic sequence unit 3. Although the example 1 showed the case where a cursor coordinate location was inputted, it is possible to also make the orientation and the zoom of a camera control from data, such as the address and the telephone number.

[0037] Drawing 13 is drawing showing an example of the local information by this example. In drawing 13 , the case where the address, the telephone number, and a name are used as specific area information is shown. For example, when the address is inputted from a keyboard, the distance L and Bearing theta applicable to the address are searched. With the telephone number, distance L and Bearing theta can be searched similarly. Furthermore, even if it uses a name, distance L and Bearing theta can be searched.

[0038] Moreover, drawing 14 is drawing showing other examples of local information, and shows the case where a telegraph pole number is used as specific area information. For example, it is possible by specifying the telegraph pole number 1 to search the distance L in which the telegraph pole exists, and Bearing theta. Moreover, the identifier of a town may be used as specific area information like drawing 10 shown in the example mentioned above. Or you may make it use the identifier of a building, the identifier of a crest, etc. as specific area information.

[0039]

[Effect of the Invention] As mentioned above, since according to this invention it is possible to always grasp the camera station of a camera, and use of a detailed map is possible according to a zoom lens ratio and it is possible to

and a person unfamiliar to camera actuation also being able to use a surveillance camera effectively.

[Translation done.]

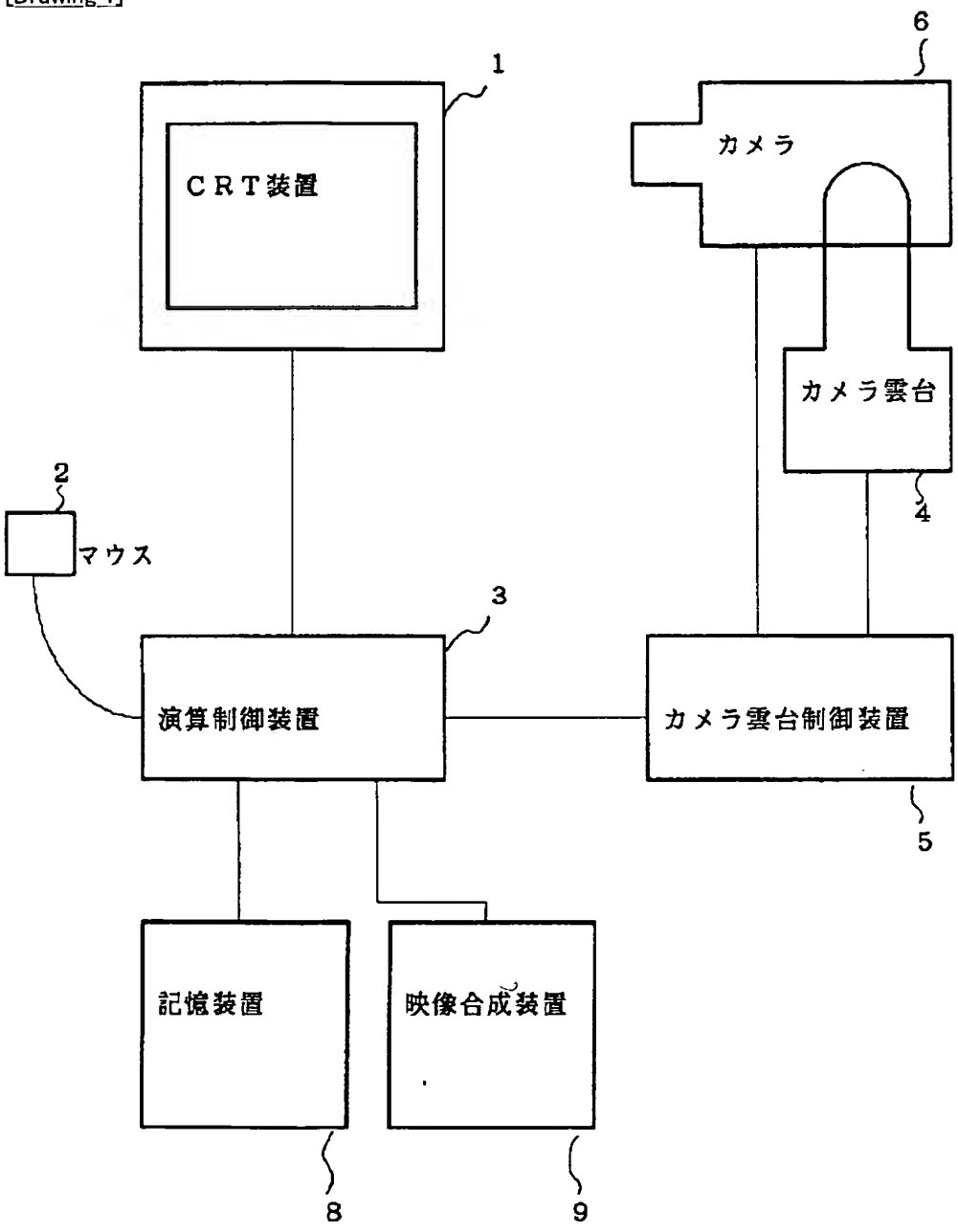
DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block diagram of the map information linkage monitor camera-control equipment by one example of this invention.
[Drawing 2] It is drawing showing the control algorithm of the surveillance camera by one example of this invention.
[Drawing 3] It is a reference drawing explaining how to pinpoint the location of a photography point from the photography image of the surveillance camera by one example of this invention, and is drawing which looked at camera equipment from the horizontal direction.
[Drawing 4] It is a reference drawing explaining how to pinpoint the location of a photography point from the photography image of the surveillance camera by one example of this invention, and is drawing which looked at camera equipment from the vertical.
[Drawing 5] It is drawing showing the algorithm for retrieving specific area information from the photography image of the surveillance camera by one example of this invention.
[Drawing 6] It is the basic screen Fig. of CRT by one example of this invention.
[Drawing 7] It is drawing showing the example of a screen of CRT by one example of this invention.
[Drawing 8] It is drawing showing the example of a screen of CRT by one example of this invention.
[Drawing 9] It is drawing showing the example of a screen of CRT by one example of this invention.
[Drawing 10] It is drawing showing an example of the specific area information by one example of this invention.
[Drawing 11] It is drawing for explaining the actuation which retrieves the specific area information by one example of this invention.
[Drawing 12] It is the block diagram of the map information linkage monitor camera-control equipment by other examples of this invention.
[Drawing 13] It is drawing showing the specific area information by other examples of this invention.
[Drawing 14] It is drawing showing the specific area information by other examples of this invention.
[Drawing 15] It is the block diagram of conventional map information linkage monitor camera-control equipment.
[Drawing 16] It is drawing showing the control algorithm of conventional map information linkage monitor camera-control equipment.
[Description of Notations]
1. CRT Equipment
2 Mouse
3 Arithmetic Sequence Unit
4 Camera Universal Head
5 Camera Universal-Head Control Unit
6 Camera
7 Monitor
8 Storage
9 Image Synthesizer Unit
11 Display Frame
12 Display Frame of Map Information
13 Display Frame of Camera Photography Image
14 Display Frame of Local Information
15 Camera-Control Display Frame
16 Camera Installation Location
17 Boundary Line Which Shows Photographic Coverage
18 Arbitration Location
19 Arbitration Location
20 Arbitration Location

[Translation done.]

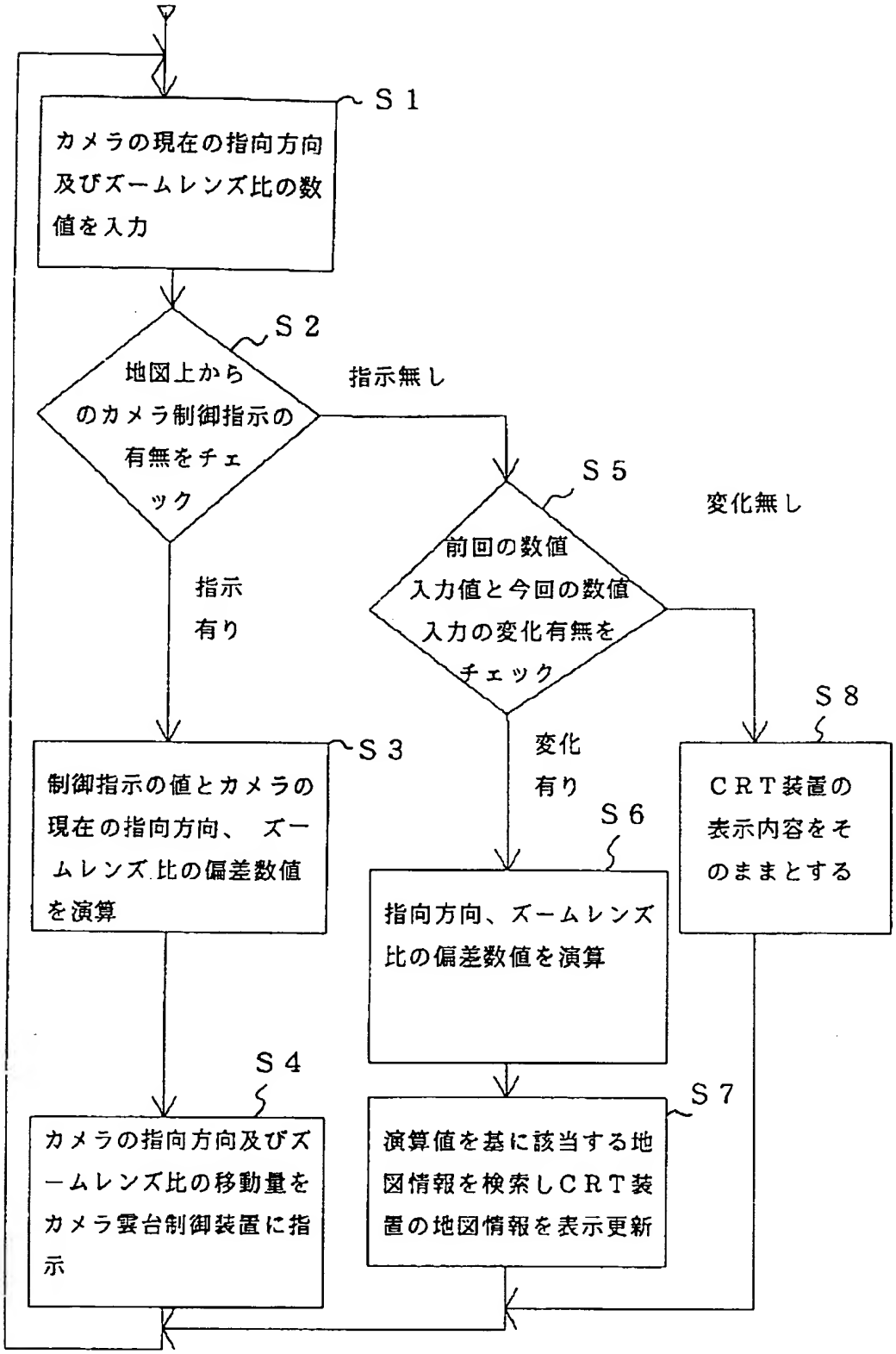
DRAWINGS

[Drawing 1]

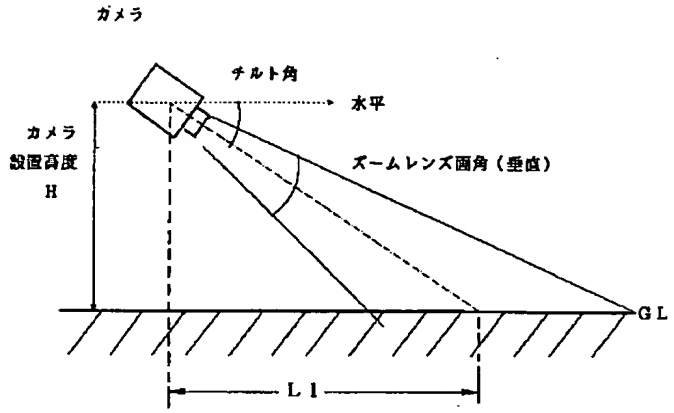


1	ＣＲＴ装置	5	カメラ雲台制御装置
2	地域情報入力手段（マウス）	6	カメラ
3	演算制御装置	8	記憶装置
4	カメラ雲台	9	映像合成装置

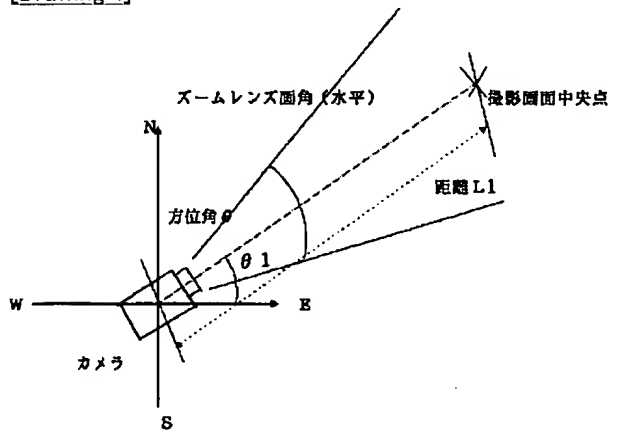
[Drawing 2]


S 1
カメラの現在の指向方向及びズームレンズ比の数値を入力
S 2
地図上からのカメラ制御指示の有無をチェック
指示無し
指示有り
S 5
前回の数値入力値と今回の数値入力の変化有無をチェック
変化無し
変化有り
S 8
CRT装置の表示内容をそのままとする
S 3
制御指示の値とカメラの現在の指向方向、ズームレンズ比の偏差数値を演算
S 6
指向方向、ズームレンズ比の偏差数値を演算
S 4
カメラの指向方向及びズームレンズ比の移動量をカメラ雲台制御装置に指示
S 7
演算値を基に該当する地図情報を検索しCRT装置の地図情報を表示更新

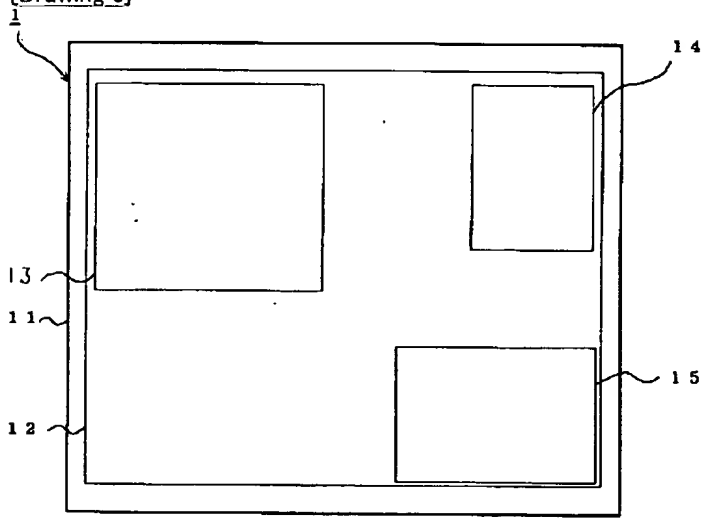
[Drawing 3]



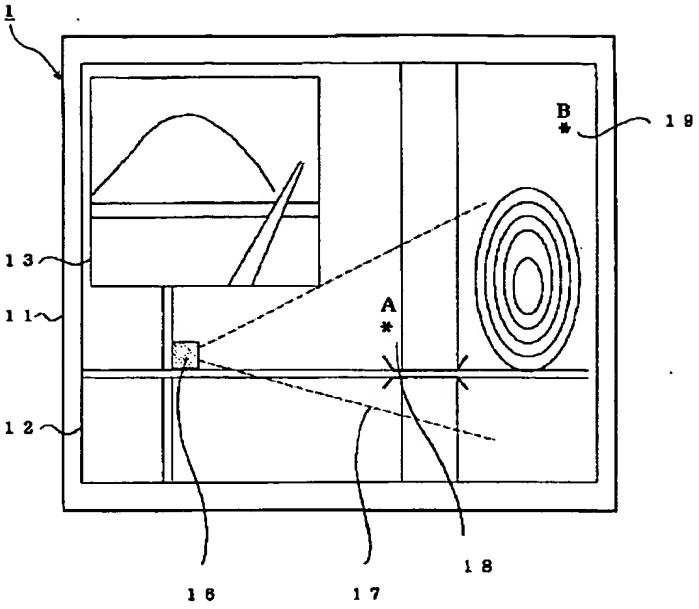
[Drawing 4]



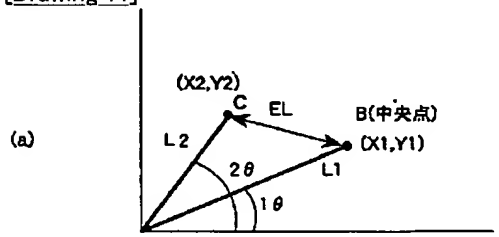
[Drawing 6]



[Drawing 7]



[Drawing 11]

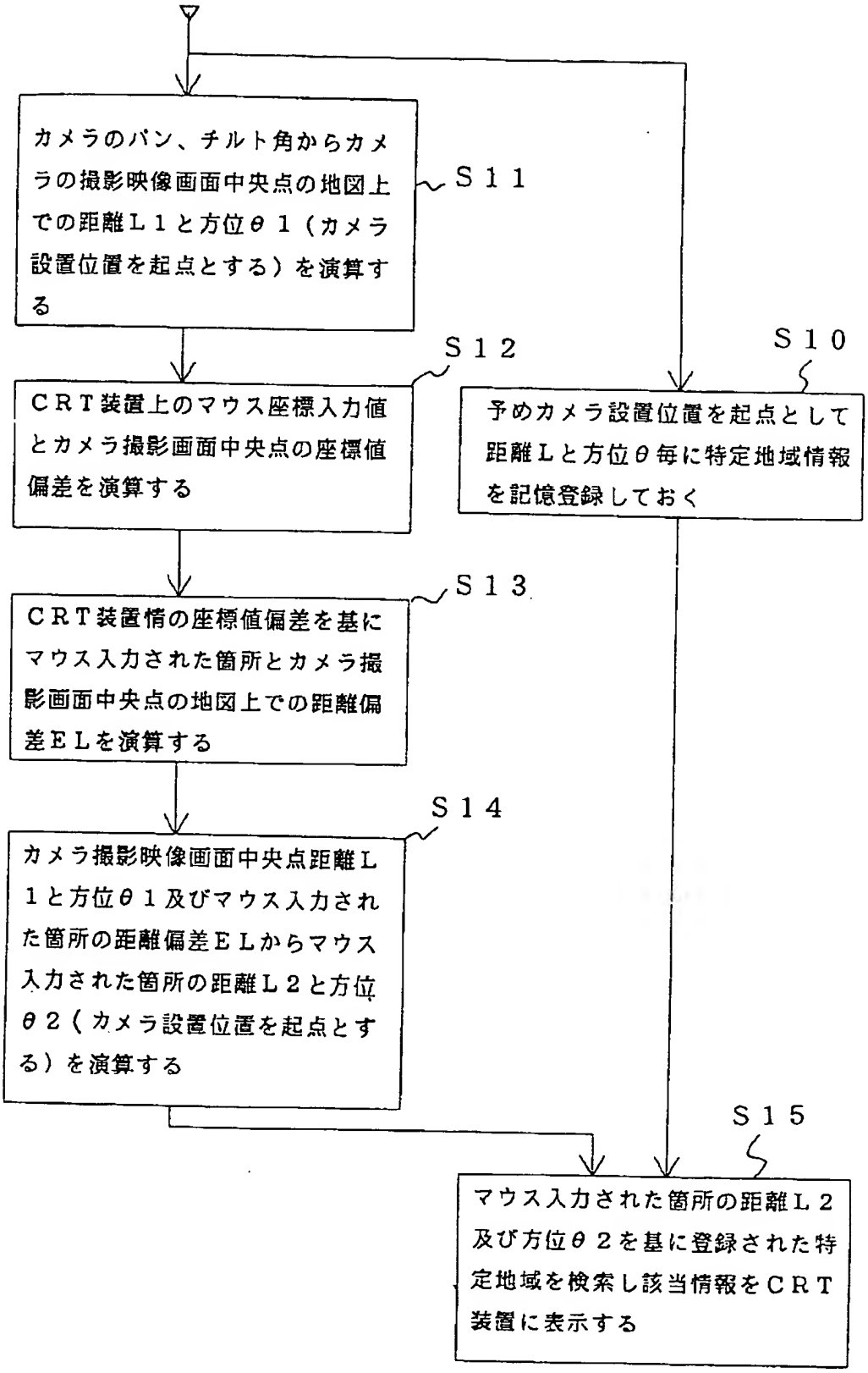


(b) $EL=\sqrt{|X1-X2|^2+|Y1-Y2|^2}$

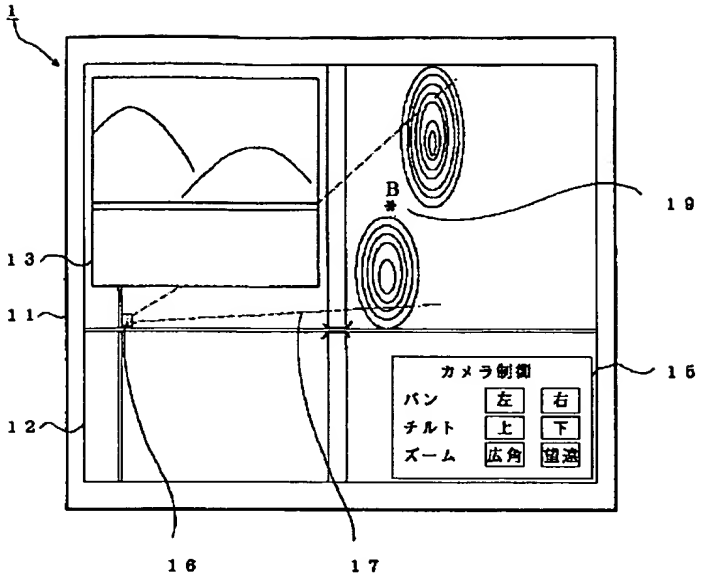
[Drawing 13]

特定地域情報			L	θ
住所	TEL	氏名		
大町1の1	44-1234	田中	La	θa
大町1の2	44-5678	鈴木	Lb	θb
⋮	⋮	⋮	⋮	⋮

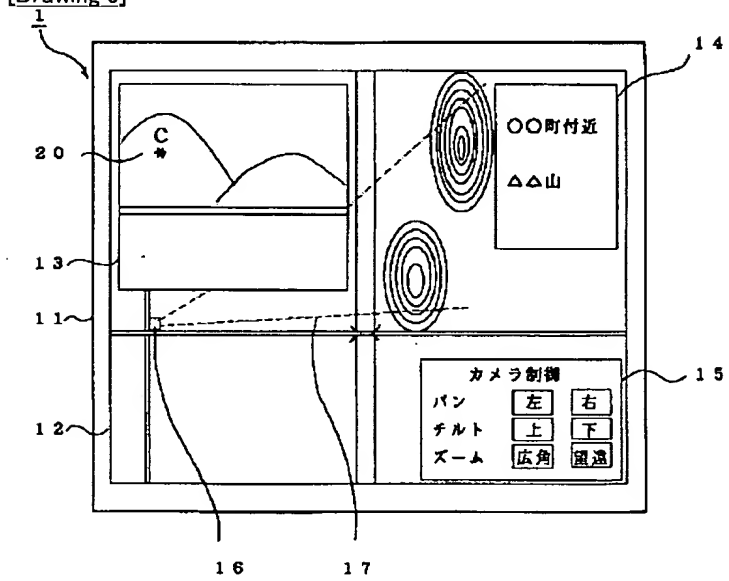
[Drawing 5]


カメラのパン、チルト角からカメラの撮影映像画面中央点の地図上での距離Ｌ１と方位θ１（カメラ設置位置を起点とする）を演算する
Ｓ１１
Ｓ１２
ＣＲＴ装置上のマウス座標入力値とカメラ撮影画面中央点の座標値偏差を演算する
Ｓ１０
予めカメラ設置位置を起点として距離Ｌと方位θ毎に特定地域情報を記憶登録しておく
Ｓ１３
ＣＲＴ装置情の座標値偏差を基にマウス入力された箇所とカメラ撮影画面中央点の地図上での距離偏差ＥＬを演算する
Ｓ１４
カメラ撮影映像画面中央点距離Ｌ１と方位θ１及びマウス入力された箇所の距離偏差ＥＬからマウス入力された箇所の距離Ｌ２と方位θ２（カメラ設置位置を起点とする）を演算する
Ｓ１５
マウス入力された箇所の距離Ｌ２及び方位θ２を基に登録された特定地域を検索し該当情報をＣＲＴ装置に表示する

[Drawing 8]



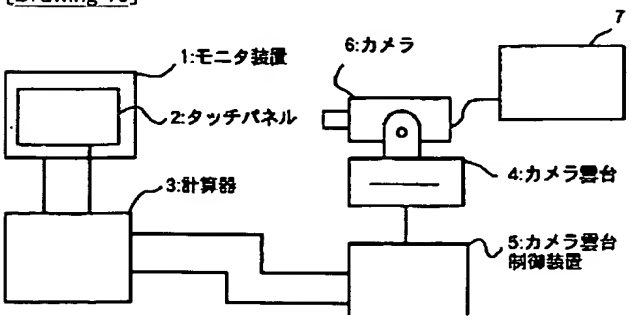
[Drawing 9]



[Drawing 14]

特定地域情報		L	θ
丁目	電柱番号		
1丁目	1	La	θa
1丁目	2	Lb	θb
1丁目	3	Lc	θc
2丁目	4	Ld	θd
⋮	⋮	⋮	⋮

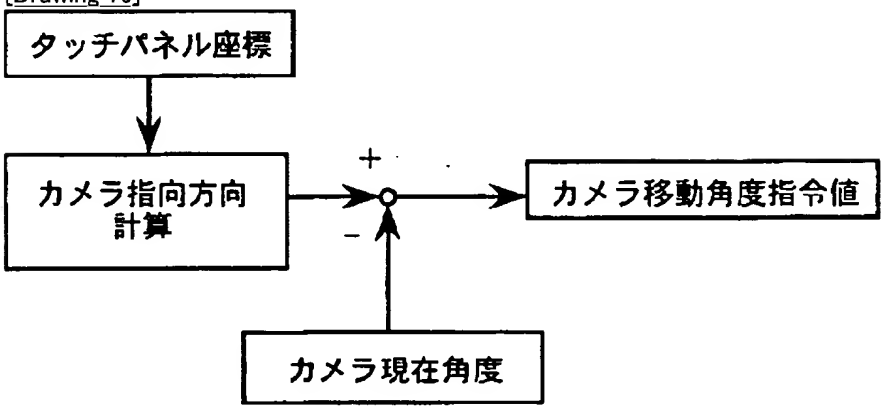
[Drawing 15]



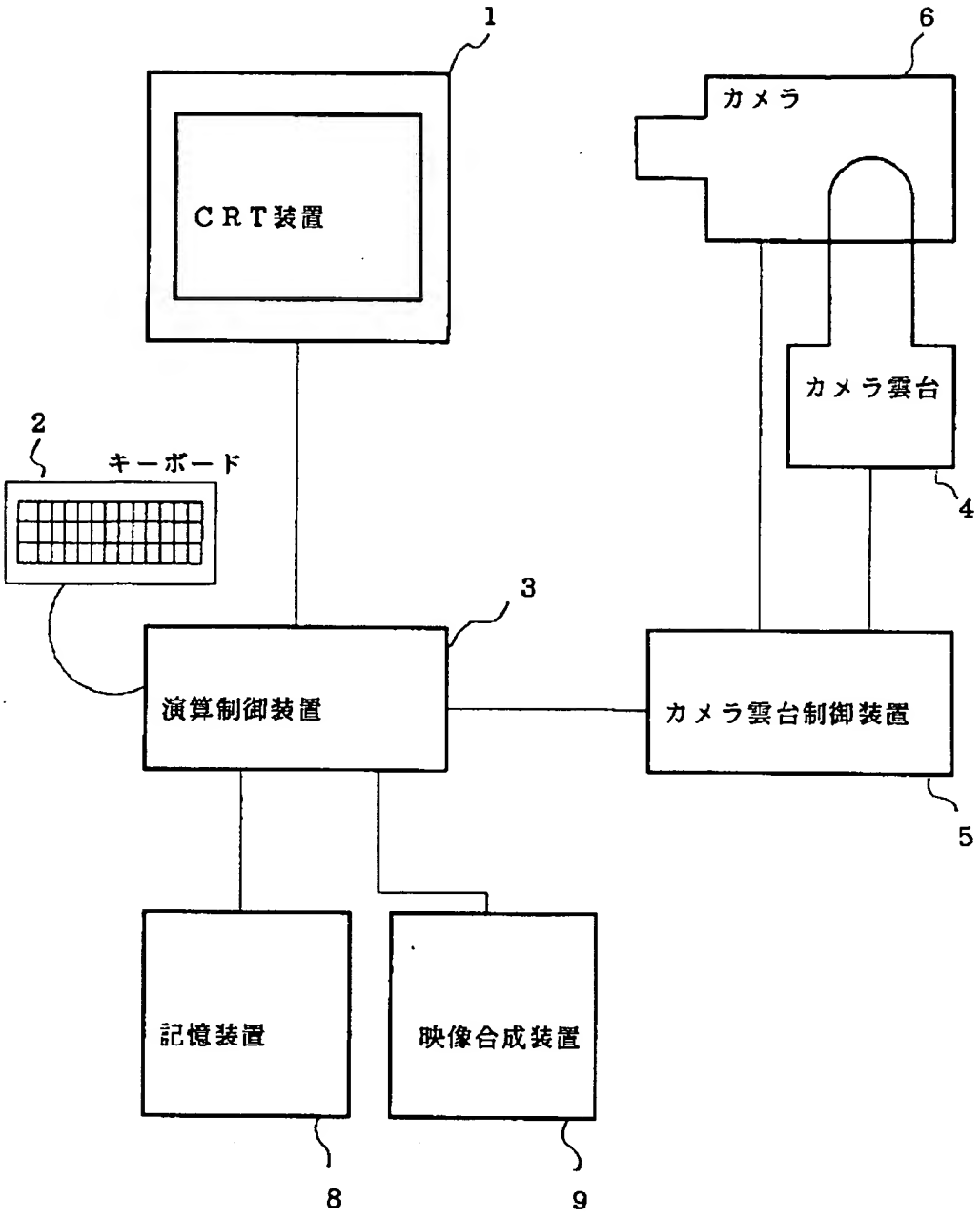
[Drawing 10]

特定地域情報	L	θ
○○町付近　△△山	La	θa
○○町付近　××山	Lb	θb
××町付近　一川	Lc	θc
××町付近　第1ビル	Ld	θd
××町付近　東タワー	Le	θe
⋮	⋮	⋮

[Drawing 16]



[Drawing 12]



[Translation done.]